Best of Amiga Public Domain

August 1989
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FOR COMMODORE AND AMIGA USERS

Commodore
MAGAZINE

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Software Reviews
64 & 128 *Keith Van Eron's Pro Soccer*
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Plus:
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EPYX
(The Uncut Version)

BAD DUDES MAKES DOUBLE DRAGON PALE BY COMPARISON



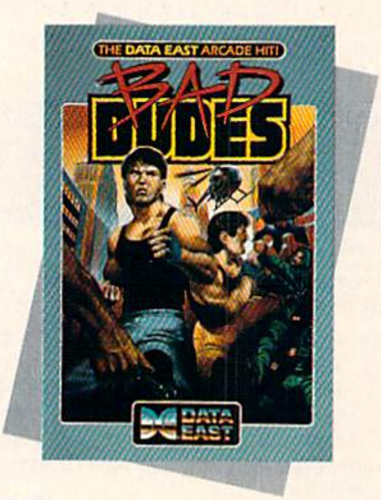
Ask anyone who's played them both in the arcade. Bad Dudes is clearly the game of choice. It's no contest.

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BAD DUDES. From Data East. Now available on Commodore, IBM, Tandy, Amiga, Atari ST and Apple II personal computers and the Nintendo Entertainment System.



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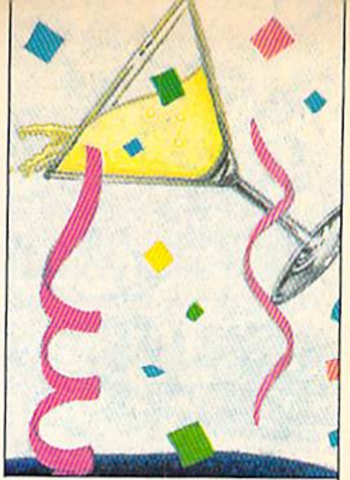
1850 Little Orchard Drive, San Jose, CA 95112 (408) 286-7074

Commodore MAGAZINE

AUGUST 1989, *Volume 10, Number 8*



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FEATURES

COVER STORY

COVER PHOTO: *Charles Bartholomew*
Software: *California Games II* by Epyx
Storyboards: *California Games II* by Cheryl Knowles

REVIEWS

DEPARTMENTS

PD Resource

Dear Editors:

I read with enthusiasm the letter by Daniel Hoffmann (April '89) regarding his interest in obtaining public domain (PD) software. There are many sources where one can obtain PD software (Fred Fish, SMAUG, etc.). To my knowledge, these sources offer PD software on ready-made disks. If there are several programs you want all on different disks, then you have to order several disks to receive those programs. Realizing this may sometimes be a costly situation, we have started a PD software service that lets you order only the programs you want. You customize the disk yourself by selecting the PD programs from our catalog. This may save on the cost of ordering PD software for some of your readers.

Sincerely,
Don Barton
Public Domain Software Resource
P.O. Box 7175
Loma Linda, CA 92354

Thanks for the info, Don. Readers who want some suggestions on what to order should turn to page 58 for Graham Kinsey's choices of the best Amiga PD releases of the year.

Teach Your Children

To the Editor:

I am very sick of people referring to the Commodore 64/128 as nothing but a "video game machine." I have only owned my 128 for a year now, but I taught myself how to program. Recently my junior high school computer teacher entered me in a programming contest. I was not very good, but I spent lots of time in front of my 128 practicing. The contest was sponsored by the NYC Board of Education. Thanks to my 128, my teacher and the great people at *Commodore Magazine,* I came in third in all of NYC! If it weren't for my "video game machine," I never would have learned BASIC! Thank you, Mr. Harris, and thanks to *Commodore Magazine.*

Yours truly,
Michael Peragine
Glendale, NY

Dear Editor:

I am an eighth grade student who is enrolled in a computer class for the top twenty people in the grade. We use Commodore 64 and 128 computers. My teacher buys much software, and he has just invested in GEOS 2.0 and *geoPublish.* Having GEOS 128 at home, I decided to "break in" the software for him. We publish a newsletter every grading period, and I was the assistant editor.

After using *geoPublish,* I don't know why so many people complain about it. What else could you want? It has so many features, and it is so easy to use, I was using it in no time at all.

In a previous letter in your magazine, a person complained about GEOS taking up too much disk room. The answer to your problem, fella, is to get another drive! At school three of our computers have two drives—so handy when using GEOS.

If you don't have two drives, forget about taking full advantage of *geoPublish.* I do agree that the programs take up too much room on the disks, but with two drives you can have the programs on one disk, and the application files on another. Every program has its bad points, but the GEOS family has very few.

Sincerely,
Christian Kugel
Brenham, TX

MS-DOSsier

Dear Larry Greenberg:

In regard to your MS-DOS column in *Commodore Magazine*, June '89: You appeared to make the same mistakes as others before you have. You mentioned, "One of the major advantages of MS-DOS is that file management is far easier and does not require the use of additional utility programs." Remember that using MS-DOS commands usually require the use of DOS COM files on disk. Commodore [64/128], on the other hand, uses built-in ROM to SCRATCH, COPY, NEW (format), COLLECT, etc. True, MS-DOS does have a few built-in commands too, but [these] must be loaded from the boot. Commodore 64 has them by turning on the computer only.

As for the commands on the MS-DOS disk: The Commodore disk drive comes with a TEST/DEMO disk. It does very much the same as what the MS-DOS commands do. I don't see the difference in running a DOS command on disk and running a program on the TEST/DEMO disk. In fact, the 1571 disk drive comes with a DOS SHELL wedge that is very much like Q-DOS for MS-DOS which costs extra.

I am not saying that the Commodore [64] is the same or better than MS-DOS. I

Continued on page 74

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1200 Wilson Drive, West Chester, PA 19380

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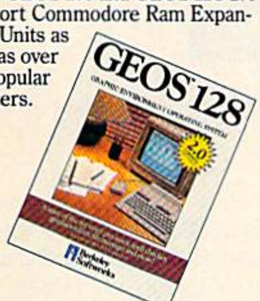
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Ultimate Challenge Grand Prize Winner Announced

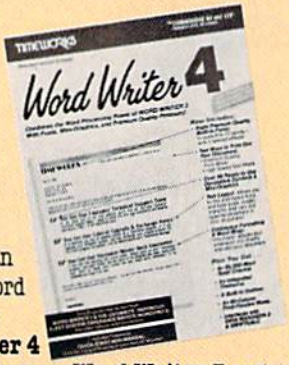
Commodore Magazine and MicroProse Software have announced that Michael Kwiatkowski of Welaka, Florida is the Grand Prize winner of the **Red Storm Rising Ultimate Challenge.** Competeting against nine other finalists, Michael won the Red Alert War Game and was named Admiral of the Fleet. His prize package includes a seven-day expense-paid trip for two to Great Britain, with stops in Dunoon, Scotland (home of the Holy Loch U.S. submarine base) and London. In addition, Michael will receive a complete library of current MicroProse software for the Commodore 64, a one-year subscription to *Commodore Magazine* and *Red Storm Rising* materials autographed by Tom Clancy, author of the best-selling novel *Red Storm Rising.*

The two runners-up were Anthony Palumbo of Bayshore, New York and Thomas McClimans of Caldwell, Idaho. They will each receive a Commodore 128D computer system, a complete library of current MicroProse software for the Commodore 64, a one-year subscription to *Commodore Magazine* and *Red Storm Rising* materials autographed by Tom Clancy.

The other seven finalists were: R. Brian Fritz of Ashland, Kentucky; Paul D. Garrett of San Angelo, Texas; Kenneth E. Gillespie of Poulsbo, Washington; James A. Kent of Colton, California; Thomas E. Newland of Homestead, Florida; Robert Allen Rusk of Wiesbaden, West Germany and Alan Darcy Smith of Eugene, Oregon. Each of these finalists will receive a complete library of current MicroProse software for the Commodore 64, a one-year subscription to *Commodore Magazine* and *Red Storm Rising* materials autographed by Tom Clancy.

Commodore Magazine and MicroProse Software would like to congratulate the winners of the **Red Storm Rising Ultimate Challenge,** and thank all of the *Red Storm Rising* players who entered. Watch for the complete story of the contest, the winners and some advanced hints and tips next month in *Commodore Magazine.*

Word Writer 4



Timeworks has released an upgrade to their popular word processing program for the Commodore 64. **Word Writer 4** includes new features like fonts, "mini-graphics," and text layout capabilities, in addition to the built-in outliner, 85,000-word spell checker and 80-column print preview found in previous versions.

Word Writer 4 has a suggested retail price of $39.95; **Word Writer 3** registered users can obtain an upgrade from Timeworks for $19.90. All Timeworks products are sold with a money-back guarantee. For further information contact Timeworks, 444 Lake Cook Road, Deerfield, IL 60015. Or call (312) 948-9200.

Indiana Jones Returns

Lucasfilm Games has released two new computer games in conjunction with Paramount Pictures' new film *Indiana Jones and the Last Crusade.* Both games closely follow the story of the latest Spielberg box-office hit starring Harrison Ford.

"We started out intending to build just one game," said Stephen Arnold, vice-president and general manager, Lucasfilm Games, "But since some players prefer wall-to-wall action, while others prefer intellectually-challenging adventures, there couldn't be one 'best' game. Rather than compromise, we designed two very different game experiences."

The Graphic Adventure, available for the Amiga and MS-DOS compatibles ($49.95 each), finds our hero chasing his father's Gestapo kidnappers through Italy, Austria, Germany and the Middle East. The game uses the interface made popular in *Maniac Mansion* and *Zak McKracken.* Players raise their score by using ingenuity to get Indy out of his scrapes. The score is expressed as an "Indy Quotient."

The Action Game features Indy's exploits in three levels with six arcade challenges. **The Action Game** is available for Commodore 64 ($24.95), Amiga ($39.95) and MS-DOS ($39.95) computers.

For further information on these new releases contact: Lucasfilm Games, P.O. Box 10307, San Rafael, CA 94912. Or call: (415) 662-1800.



Prison

Being incarcerated in the year 3033 is no fun. Actionware's latest Amiga release is *Prison*—a futuristic Alcatraz that's not an island but a planet from which you must escape. Naturally, you've been unjustly convicted and sentenced to exile on the planet Altrax. There are 300 screens and multiple escape routes to explore.

Prison carries a suggested retail price of $39.95. For more information contact:
Actionware, Inc.
38 W. 255 Deerpath Rd.,
Batavia, IL 60510.
Phone: (312) 879-8998.



World of Commodore

West Coast Commodore and Amiga enthusiasts converged on the Los Angeles Convention Center for three days in May to try and to buy the latest products for their favorite computers at the World of Commodore. More than 50 developers, dealers and publishers along with Commodore Business Machines were on hand to exhibit products for all the Commodore lines.

In a special presentation, master of ceremonies Gordon Hunter, president of the sponsoring Hunter Group awarded NewTek an "Irving" for drawing the most traffic at the show. Minitel Services Company, a newcomer to the Commodore community, received the best-designed booth award for their attractive presentation of their international interactive electronic communications service.

Five Commodore user group members were honored for their involvement in the Commodore Partners Program. Scott Peterson of Rockwell Microcomputer Club, Downey, CA was awarded top honors; in addition to the trip to World of Commodore, Mr. Peterson was presented with 500 Amiga software titles. Other honored user group members were Thomas Trocco, *Kids Computer News,* New York, NY; Jack King, Arkansas Amiga Users Group, Little Rock, AR; Lee Savory, AMICON, Columbus, OH; and Brian Gagnier, Northwest Amiga Users Group, Portland, OR.

Richard Cho of Rosemead, CA was the lucky winner of the drawing for an Amiga 500 system sponsored by Commodore Business Machines.

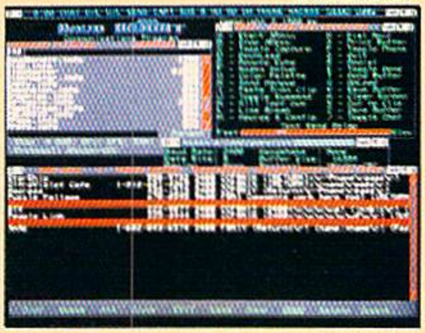
Progressive Peripherals & Software

BaudBandit



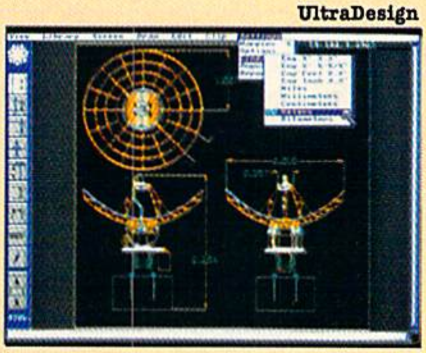
PP&S was showing **BaudBandit-2400,** a 2400 baud modem that works on all computers equipped with an RS232C port. The new modem features auto-answer and auto-dial capability, built-in memory for storing phone numbers and LED readouts. **BaudBandit-2400** comes with **BaudBandit** telecommunications software and is covered by a one-year warranty. Suggested retail price is $169.95.

BaudBandit



In addition, Progressive's **UltraDesign** was on display. This high-end Amiga CAD system features configurable parameters and a separate PasteUp program to allow output of a drawing over several pages. **UltraDesign** also contains a utility for converting files to and from *IntroCAD, AutoCAD* and other formats. The program retails for $399.95.

UltraDesign



MiniGen is PP&S's low-cost broadcast-quality genlock for the Amiga. **MiniGen** connects externally to work with all Amiga models. Available in NTSC or PAL format, **miniGen** retails for $219.95.

For more information on these new products contact: Progressive Peripherals & Software, 303 Kalamath St., Denver, CO 80204. Or call: (303) 825-4144.

Show Notes

Kara Computer Graphics presented a lively videotape that featured some cleverly choreographed animated logos . . . Many folks took the opportunity to stop by Berkeley's booth to stock up on geoTitles . . . Newtek's **Digi- Paint III** was just about ready for shipping at showtime . . . *Commodore Magazine*'s booth featured stunning poster-size reproductions of this year's graphics contest winners courtesy of Philadelphia Video Lab, 2212-14 Walnut St., Philadelphia, PA 19103; (215) 567-3222. The artwork was deemed suitable for framing by the many attendees who dropped by and tried to buy the graphics off the wall.

Gold Disk

Gold Disk's new HardWired line of entertainment software for the Amiga was also drawing a lot of attention at the show. The company promoted its new shoot-'em-up *Denaris* with a contest to find the high scorer among show attendees. An Amiga 500 was awarded to the fastest joystick handler in the west who was David Jiminez with 51940 points.

Gold Disk also told us of some forthcoming enhancements to *Professional Page.* Among them, Compugraphic font compatibility is on the horizon for *Pro Page.*

For more information contact: Gold Disk, 2171 Dunwin Drive, #13 Mississauga, Ontario, Canada L5L 1X2. Phone: (416) 828-0913.

Mindware

Following on the heels of their release of *PageRender 3D* and *PageSync 3D,* Mindware announced that they're developing a software package that plays animations directly from an Amiga hard drive, allowing sequences 60 times longer than RAM-based animations. In addition, new software permits output to a PostScript-compatible printer from *PageRender 3D.* For details contact: Mindware International, 110 Dunlop St. W., Box 22158, Barrie, Ontario, Canada, L4M 5R3. Or call: (705) 737-5998.

Minitel

Minitel Services Company took the opportunity to introduce its worldwide electronic communications service to North American Commodore users. According to company president Joe Mazzeo, the service will allow Commodore 64 and 128 users to

Continued on page 8

Continued from page 7

access "cultural classroom-type exchanges between children around the globe, tutoring, homework support, children's encyclopedia look-up, research guides and other interactive learning environments." He added, "And certainly, interactive global personal computer games are sure to be incredibly popular."

Minitel's service is based on the teletel protocol and features a menu-driven graphic interface with an eight-key system designed for users who are not computer literate. Minitel does not operate its own applications services, but encourages small businesses and entrepreneurs to create such services for national and international markets. Current services available include: The Meeting Place, Home Office Business Network, New York Networks and Job Search.

For more information contact: Minitel Services Company, 2900 Westchester Ave., Suite 101, Purchase, NY 10577. Or call: (914) 694-6266.

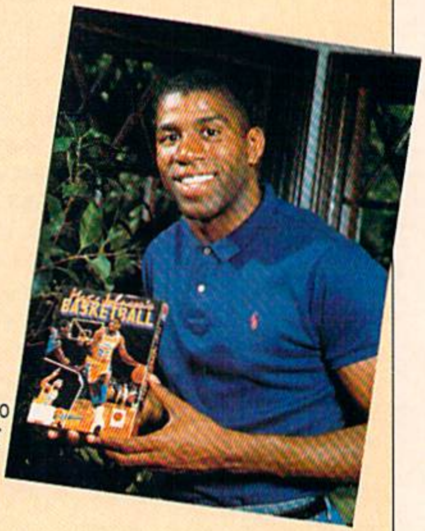
Access Technologies

Access Technologies was showing their new Amiga program **DigiWorks 3D.** The program will convert digitized images, clip art or two-dimensional graphics into 2D or 3D objects that can be rendered and animated. Suggested retail price of **DigiWorks 3D** is $129.95. For further information, contact: Access Technologies, P.O. Box 202197, Austin, TX 78720. Phone: (512) 343-9564.



Next Stop, Valley Forge . . .

Attention eastern seaboard! The next World of Commodore show will be held September 22-24, 1989 at the Valley Forge Convention Center in King of Prussia, PA. For ticket information contact The Hunter Group at (416) 595-5906.



Virgin Mastertronic

Virgin Mastertronic previewed a new Megagames line for the Amiga. Megagames titles will be identical to those released in the arcade—a result of the company's affiliation with Arcadia, which uses Amiga-based technology in their arcade cabinets. The first release under this new line will be **Magic Johnson's Basketball** to be followed by **World Trophy Soccer.** The suggested retail price of each game will be $44.99. For details contact: Virgin Mastertronic, Inc., 711 W. 17th St., Suite G9, Costa Mesa, CA 92627. Phone: (714) 631-1001.

Artworx Releases

Artworx Software has released four new Amiga titles. **Tank Attack** ($29.95, also available for the 64 at $24.95) is a game for two to four players in which each player controls a Tank Corps and tries to capture enemy headquarters.

Jigsaw Puzzlemania ($29.95) randomly generates puzzles in six sizes from 4″ × 4″ to 12″ × 12″. The program includes more than 10 puzzles and accepts user-generated graphics for creation of personalized puzzles.

World Snooker (and Pool and Billiards) ($24.95) includes five different types of "pool" played worldwide. The program includes two versions each of snooker, billiards and pool.

Colossus Chess X ($34.95) is the first chess program that learns from its mistakes. The more you play, the better **Colossus** gets. The program also allows you to view the board from any angle.

For further details on these new programs, contact: Artworx Software, 1844 Penfield Rd., Penfield, NY 14526. Or call: (800) 828-6573 or (716) 385-6120.

The Kristal

It's not the Amiga on Broadway, but Broadway on the Amiga. Cinemaware has announced **The Kristal,** an "interactive stage production" based on the musical *The Kristal of Kronos.* The player's alter ego is Dancis Frake, a space pirate who sets out to find the Kristal of Kronos. **The Kristal** includes "the finest elements of graphic adventure, space exploration and arcade action." Suggested retail price of **The Kristal** is $44.95. For details contact: Cinemaware Corporation, 4165 Thousand Oaks Blvd., Westlake Village, CA 91362. Phone: (805) 495-6515.

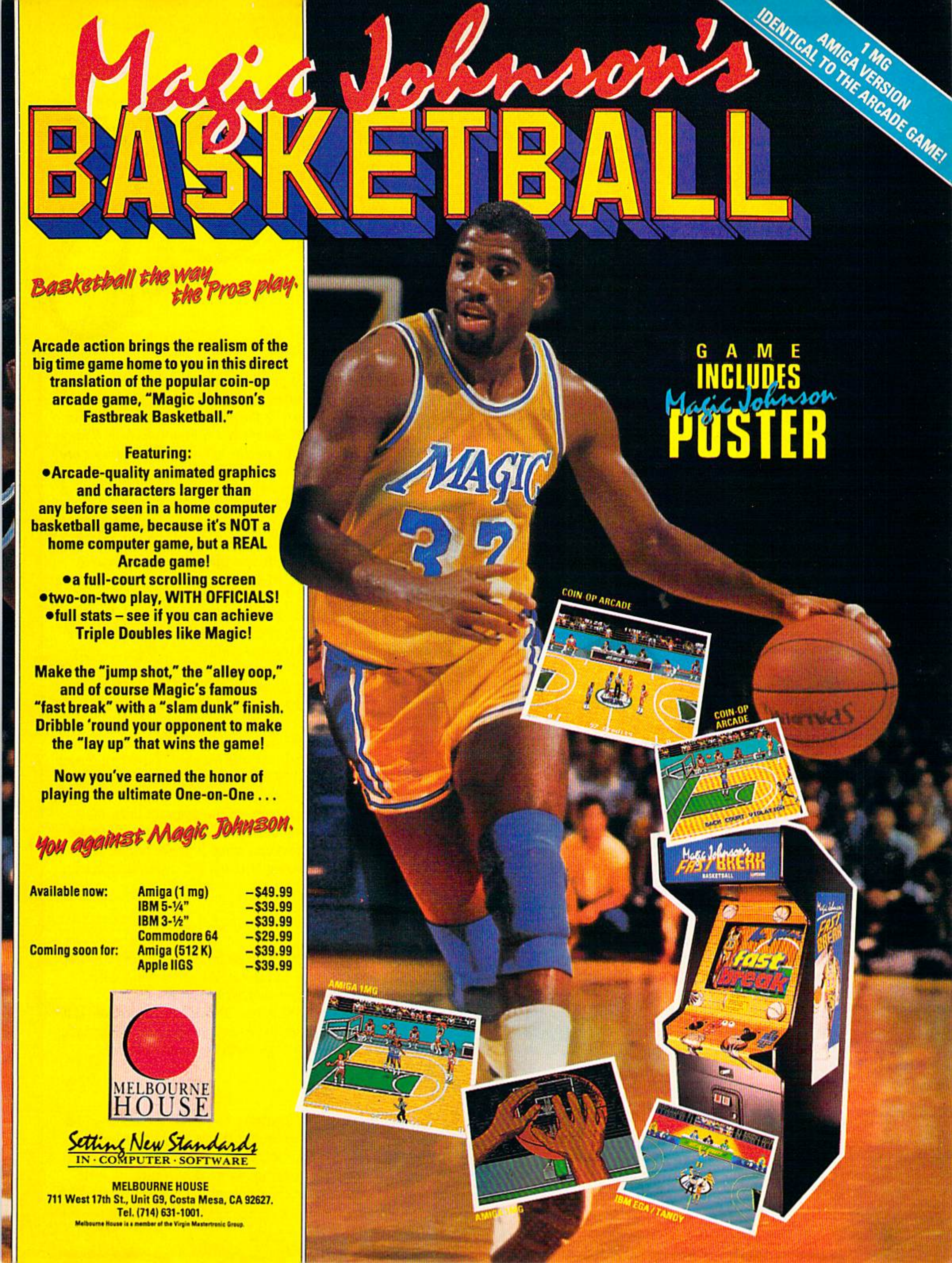
SSI Marches On

Strategic Simulations, Inc. has three summer releases planned for the Commodore 64. **Storm Across Europe** ($59.95) is a strategic-level game that covers the European front from 1939–45. One to three players control infantry, tanks, paratroops and air support.

Curse of the Azure Bonds ($39.95) uses an expanded version of the game system established in SSI's popular AD&D installment *Pool of Radiance.* **Curse** adds higher level characters, new character classes and new spells.

SSI also plans to release a 64 version of **Heroes of the Lance** in the same time frame. The suggested retail price is expected to be $29.95.

For details contact: Strategic Simulations, Inc. 1046 N. Rengstorff Ave., Mountain View, CA 94043-1716. Phone: (415) 964-1353.


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AMIGA 1MG
IBM EGA/TANDY

Compiled by Louis F. Sander

LOU SANDER'S TIPS & TRICKS

In February, we announced a programming contest for short and useful programs for Commodore computers. As you might expect, your creative fellow-readers responded quickly and in large numbers—over 200 entries were received by the deadline of March 15.

There were so many good entries, in fact, that the judging is still going on! With a $100 prize for the most useful, original and user-friendly program, we don't want to make hasty decisions.

This month's column features several of the contest's most notable entries. Judging should be completed by next month, when we hope to announce the winner.

In the meantime, if you have a short program or bright idea that you'd like to share with the world, write it up and send it in. We seek hardware and programming hints, short programs or subroutines, ideas for a better computer room, and similar items of value to Commodore and Amiga computerists. If you read "Tips & Tricks" regularly, you know just what we look for.

We pay closest attention to tips that come double-spaced from your printer or a typewriter. You can help yourself by sending your material in that form. Send it to

Louis F. Sander
P.O. Box 101011
Pittsburgh, PA 15237

Game Buyer's Guide: Buying a new game can sometimes be a difficult decision, especially with all the new games on the market these days. If you read the ads and the boxes, they all say "this is the most awesome adventure game you'll ever see" or "these are the best graphics ever programmed by the mind of man."

To get a realistic point of view, read the software reviews in *Commodore Magazine*. These show both sides of the game, good and bad, and can be relied on for accuracy and objectivity.

When you get your game, always make a backup copy and use that copy for your day-to-day activities. Keep the original on a shelf in another room, preferably in its original box. And keep the sales receipt with the original disk and box, just in case you have to return something for credit or upgrading.

Paul Stagner
Agency, MO

Efficient Typing of Magazine Programs: I have been typing in BASIC programs from magazines such as *Commodore* every month for the last year, and I can honestly say that it gets easier with each program. Along the way I have discovered these secrets of making the task more enjoyable:

1. Use the checksum program. *Commodore Magazine*'s Magazine Entry Program is one of the best. [***Editor's Note:** Because of the short and sweet nature of the programs found in "Tips & Tricks," we don't use the Magazine Entry Programs here. This places an extra burden on the reader, but since the programs are so brief, we hope that you don't mind it.*]
2. Look over the program before typing it. If there are lots of DATA statements, type KEY 1,"DATA" while in direct mode on the 128. Then you can simply press the F1 key to spell DATA. With eight function keys available, you can save a lot of typing.
3. Put the 128's AUTOmatic line numbering command to work by entering AUTO 10 in direct mode when the program is numbered by tens, AUTO 2 when it's numbered by twos, etc.
4. If two lines are nearly identical, list the line that has been entered first, cursor up to it, then change its number to that of the second line. After making any additional changes, simply press the RETURN key.
5. Don't try to do the whole program in one sitting. When you begin making frequent mistakes, it's time to take a rest. (Save the program first, though!)
6. Save your work frequently, remembering to use a different filename each time. I include the line number I have progressed to with each save, so FINANCE240 is easily identified as a finance program that I've typed up to line 240.
7. Pay close attention to spaces in the program lines. It's quite easy to overlook a required space when proofreading the typed line against the magazine listing. If you're failing to match the checksum value, experiment with carefully placed spaces.

Glen Young
Renton, WA

Fixing Disk Errors: Here's a trick to try when one of your disks seems to have developed a bad sector. It's particularly useful when the disk generates repeated #23 Read Errors.

Use a disk editor program to read the sector in question. If it can be read, which is probably the case, use the disk editor to rewrite it to the disk. Your troubles will probably be cured.

Cameron Goble
Albuquerque, NM

Benefits of Programming Contests: Our little contest inspired thousands of people to give thought to practical programs they could write for their computers. They created programs for betting and lottery playing, making "to do" lists, watching your weight and calories, drilling students in math, working out high

school science problems, creating shopping lists and more.

Other entries included clock programs, calendar programs, forms printers, loan calculators, wage and hour figurers, alphabetizers and tools for tuning guitars. A number of them concerned astronomy and related fields like finding orbiting satellites.

Our contest required programs to be shorter than four blocks on the disk, which encouraged contestants to work. One entrant said, "Thanks for the crash course in crunching programs! Originally my entry was 17 blocks long. The final version is only three, and it does 300% more than the first one."

The requirement to include a disk and a printed listing also encouraged creativity, mostly by those who didn't meet it. One person said "I'm sorry for hand writing the listings, but my printer got destroyed in a house fire." I guess his keyboard and disk drive were spared, though.

One student at Montana State University wrote what seems to be a nice program, but failed to include a disk. "College," he said, "has a way of zapping one's checkbook to extinction." I sympathized with his plight, but with 199 other programs to evaluate, I didn't have time to type his into my computer. Oh well—live and learn.

Louis F. Sander
Pittsburgh, PA

Phoneword: We've all seen the use of "telephone acronyms" such as 1-800-USEDCAR or 364-HAIR. This program lets you find all the acronyms for your own phone number or that of a friend. It creates all the possible word combinations for any seven-digit number you enter. You have the option of viewing the combinations (all 2187 of them) on the screen, or of printing them out on seven sheets of paper.

As the program runs, the computer generates all possible words from the phone number you have entered and the letters the phone company has assigned to each number. (The number 2 can be A, B or C, 3 can be D, E or F, and so on). Since the numbers one and zero do not have alphabetical designations, the program uses the 1 or 0 in the word. Also, the letters "Q" and "Z" will not appear in any words because they are not included in the letters on the telephone dial.

So what's it good for? Aside from finding the words that can be made from your own telephone number, try the numbers of your friends or your business. Know somebody expecting a baby? Type in their number (or their seven favorite digits) and get over 2000 suggestions for names! Starting a business? Let your phone number suggest a name. I am not responsible, however, for stupid or undesirable names that can be applied to anyone's telephone! Have fun.

Philip Geiser
Stronghurst, IL

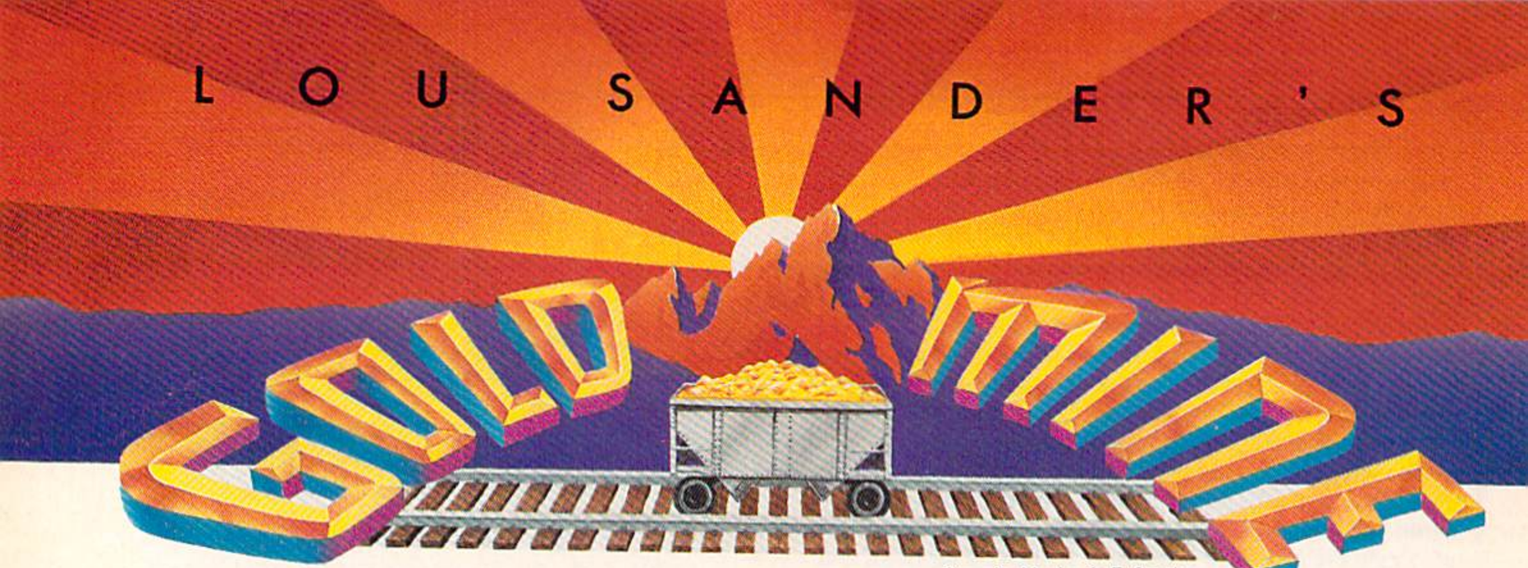
```
100 PRINT"[CLEAR,RVS,SPACE8]
    PHONEWORD - PHIL GEISER[SPACE9]"
110 PRINT"[DOWN] THIS SHOWS ALL THE
    WORDS THAT CAN BE"
120 PRINT" MADE FROM THE 'LETTERS' IN
    A PHONE"
130 PRINT" NUMBER."
140 DATA 0,0,0,1,1,1,A,B,C,D,E,F,G,H,
    I,J,K,L,M,N,O,P,R,S,T,U,V,W,X,Y
150 DIM T$(30): FOR X=1 TO 30
    : READ T$(X):NEXT
160 INPUT"[DOWN] PHONE NUMBER (7
    DIGITS ONLY)";P$
170 PRINT: PRINT: IF LEN(P$)<>7 THEN
    160
180 INPUT "PRINTER OR SCREEN --- P/S
    [RIGHT3]S[LEFT3]";R$
    :PRINT CHR$(147)
190 IF R$="P" THEN OPEN 4,4: CMD 4
200 PRINT "THESE ARE THE WORD
    POSSIBILITIES"
210 PRINT"FOR PHONE NUMBER "P$: PRINT
220 FOR A=1 TO 3:N(1)=A:FOR B=1 TO 3
    :N(2)=B:FOR C=1 TO 3:N(3)=C
    :FOR D=1 TO 3
230 N(4)=D:FOR E=1 TO 3:N(5)=E
    :FOR F=1 TO 3:N(6)=F:FOR G=1 TO 3
    :N(7)=G
240 FOR H=1 TO 7
250 X=N(H): Y=VAL(MID$(P$,H,1))
    : W$= W$+T$(Y*3+X)
260 NEXT
270 PRINT W$+"[SPACE3]";:W$="":WK=WK+1
280 NEXT:NEXT:NEXT:PRINT:PRINT:NEXT
    :NEXT:NEXT:NEXT
290 PRINT WK"POSSIBILITIES"
300 PRINT "FOR PHONE NUMBER --> "P$
310 IF R$="P" THEN PRINT#4: CLOSE 4
```

Calendar Maker: This little program prints out a one-page calendar for any year from 24 A.D. onward. [***Editor's Note:*** *I noticed a bug for the year 2000, which although evenly divisible by four is not a leap year. Enterprising readers should easily be able to fix the bug.*]

Allan Vest
Address Unknown

```
100 PRINT"[CLEAR,RVS,SPACE6]
    CALENDAR MAKER - ALLAN VEST
    [SPACE7]"
110 PRINT"[DOWN]THIS CALCULATES AND
    FORMATS A ONE-PAGE"
120 PRINT"YEARLY CALENDAR. PRESS [RVS]
    RETURN[RVOFF] TO QUIT."
130 OPEN 1,4:DIM D$(12,6)
    :S$="[SPACE5]":L$="S[SPACE2]M
    [SPACE2]T[SPACE2]W[SPACE2]T
    [SPACE2]F[SPACE2]S[SPACE2]"
140 INPUT "[DOWN]YEAR";Y
    :IF Y=0 THEN END
150 A=Y-24:B=A+INT(A/4):L=1
    :IF A/4-INT(A/4)=>.25 THEN B=B+1
    :L=0
160 B=INT(B-(7*INT(B/7)))
    :FOR M=1 TO 12:PRINT M:C=B:READ K
    :IF K=28 THEN K=K+L
170 B=B+K:B=INT(B-(7*INT(B/7))):Z=1
    :Z$="":FOR X=1 TO C
    :Z$=Z$+"[SPACE3]":NEXT
180 Z$=Z$+"1[SPACE2]":IF C=0 THEN
    Z$="1[SPACE2]"
190 FOR E=1 TO 6:D$(M,E)=S$
```

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Compiled by Louis F. Sander

This month's nuggets emphasize the games for which we receive the most submissions of tips; you'll probably recognize the names. In addition, we have a nice assortment of games you've never seen here before. We hope this mixture will be of interest to the largest number of readers.

As always, many of our tips will work on any computer, whether it's from Commodore, Apple, Atari or IBM; others apply to only one machine.

Don't forget that many tips require skill as well as knowledge, and that since they apply to so many games and computers, we can't test every one.

Also don't forget the forthcoming Gold Mine book, which should be coming to market in a month or two. (It's hard to predict just when.) When the gods of publishing see fit to spew it forth, I know you're going to love it.

If you have a nugget to share with our readers, write it up and send it in. Stake your claim at:

The Gold Mine
P.O. Box 101011
Pittsburgh, PA 15237

Use a separate sheet for each game, and put your name and address on every paper you send us. Neatness counts, and full-size double-spaced printouts are preferred.

If one of your nuggets is printed, you'll get momentary worldwide fame, the knowledge that Gold Mine Rules, and a nice little $5 grubstake.

Airborne Ranger: To get promoted as quickly as possible, repeatedly play a mission that you can complete successfully, raising the level each time. You'll reach Lt. Colonel before you know it. Once you get there, set the game on Campaign, and hope you get a mission you can easily solve.
Todd Gunnerson
Canaan, NH

Airborne Ranger: If your mission requires you to blow something up, be sure to complete the mission. Drop a pod somewhere around the target, to insure that your Ranger will have at least one LAW rocket and time bomb. Drop one more pod just before you jump. It will be very useful for heavily guarded areas where you need more weapons and first aid.

When jumping, try to land in a foxhole or a pond. Duck as soon as possible to avoid contact. This will keep the machine gun nests from picking you off after landing.

Try to make your way to no man's land and run as close as possible to it. It will keep enemy guards from coming in from all directions.

After landing, arm yourself with the knife. This will keep you from alerting the guards too soon. When you make it halfway across the map, arm the carbine. Your mission will be lots easier, and you won't get killed so soon.

When crawling on higher-level missions, always keep your Run/Walk status on Run. It's much easier to avoid grenade-throwing guards that way.

When running from guards, never run in a straight path. If you zig-zag to your cover, it will be harder for them to hit you.

The guards always finish off their kills. After a confrontation, you can play dead by getting in a foxhole and ducking. When the guards walk up to you to make certain you are dead, let them have it with your carbine.

Machine gun nests can be your friends. When in danger, jump into a foxhole but don't shoot. The guards will walk around mindlessly looking for you. If you're lucky, the machine gun nest will shoot them if they are in range.

Finally, save your heavy weapons for machine gun nests and other large targets. Grenades can blow up tents, shacks, fuel dumps, mini-bunkers, mini-tanks, guard posts, communications posts, turrets and radar antennas. When crossing icy ponds, remember that grenades can also blow holes in the ice.
Darren Critchfield
Carrollton, TX

Auto Duel: If you run a lot of courier missions, you may find it easier if you stay in Philadelphia, New York, Albany, Boston and Manchester. All these cities have AADA buildings, and most of them have garages and weapons shops. This allows you to fix up your car and pick up other assignments along the way.

Avoid going to Baltimore, because the road is over 500 miles long. If you use lasers, you may run out of power before you get there.
Kris Pivin
Napanoch, NY

Auto Duel: When creating a character, spend your skill points on Marksmanship and Driving Skill. Improve your Mechanic Skill by taking lessons at garages after you win some Amateur Nights.

To get lots of money with little risk, enter Amateur Night until your prestige is 6. Then buy the cheapest car possible and get a courier job at Joe's Bar. Repeat as often as you'd like.

When your prestige reaches 45, go to Dover Weapon Shop for a very interesting tip.
David Victor
Waukegan, IL

The Bard's Tale I: The answer to the riddle on Level 3 of Mangar's Tower must be given one word at a time. It is LIE WITH PASSION AND BE FOREVER DAMNED.
Kris Pivin
Napanoch, NY

The Bard's Tale I: Here's how to copy any item, giving you more money or supplies than normal people think possible.

Keep the good copy of your characters on Disk A. Format another disk, Disk B, to be a backup disk. Enter the Adventurers' Guild with Disk B in the drive.

Load any character not used, or create a new one, and give him everything you want multiplied—money, weapons, armor, etc.

Remove the character and add him again. Give back all of the items and remove the character on disk A. Exit the Adventurers' Guild, insert Disk B, and re-enter the Adventurers' Guild. Distribute the extra items.
Andy Stice
Jacksonville, IL

The Bard's Tale I: If you need a quick 60,000 experience points, enter Harkyn's Castle and teleport to +5N, +12E, +2up. This will take you into a battle with 396 Berserkers! Be advised that you must have an extremely powerful party to come out of this battle in one piece.
Jeff Calog
Greensboro, NC

The Bard's Tale I: Before fighting the 396 Berserkers, your first three characters should have a minimum of 150 hit points, and they should have an armor class of LO. The Fifth Bard Song and the spell YMCA both lower the whole party's armor class.

A Demon or Wind Dragon may prove very useful against the Berserkers. It also helps to have a Mage that can cast Mindblade, which affects every foe.
Chris Harrison
Morgantown, WV

The Bard's Tale I: When you're fighting the 396 Berserkers, be sure you're not wearing the cloaks you found on the first floor of Harkyn's.

After fighting these fellows, teleport to the entrance, leave and return to the Guild. This replaces the Berserkers so you can fight them again!

After destroying Mangar, you can leave his chambers by teleporting down from the little room behind the place you fought him. You're better off having a Demon Lord while fighting Mangar, rather than using the Thor figure. I've found that as soon as I use the figure, he is dead.
Michael Shapella
New Philadelphia, PA

The Bard's Tale III: There are very useful items in a building near the entrance to the Ruins of Skara Brae.

In Arboria, you can save spell points by using Arefolia instead of casting GILL. In fact, it's a good idea to make a list of the different types of spells (healing, combat, summoning), how many spell points they require, and exactly what they do. There is no camp in Arboria, so you must either carry only six people or return to the camp via ENIK to accept Hawkslayer.

In the Ice Keep's first level, the answer to the riddle is HAWKSLAYER.

Tslotha can only be slain by the Nightspear from Valarian's Tower. Give it to your hunter.

Have your Bard singing song #1 or #2 when not in combat.
Jeff Barnes
Address Unknown

The Bard's Tale III: For a nice surprise, go to the temple of the God, talk to the Priest, and type in the word BURGER.
Kris Pivin
Napanoch, NY

Cavern of Riches: In the brick building, type Light Lantern to turn on the light. Type Move Rug twice to reveal a trap door. (You need the keys from the cabin to open it.)

Use the bird to get rid of the snake. Typing Drop Bird will scare it off. When you enter the trap door, take the wand and type Away. The bookcase will disappear, revealing a passage. Don't enter it without a lit lantern.

To get past the part with the plant, take the bottle into the forest until you find water. Fill the bottle, return to the room and water the plant.
Jake Frederick
West Tremont, ME

Defender of the Crown: When raiding a castle, push the first guard forward as far as possible. Then begin to retreat, striking the guard every few steps. This should get you into the castle where you will face another guard. Force him up the steps, then begin moving backward while thrusting with your sword. Repeat this as much as necessary until you kill the guard and get the gold. Or, for that matter, until you save one of the ladies.
Henry Davar
Rego Park, NY

Defender of the Crown: For best results, choose Cedric. In the first round, move your army into a territory with an income of at least three. In the next round, joust for land. With the help of Cedric's great jousting ability, you should find yourself three lands richer and two lands ahead of everyone else. With that advantage, plus Robin's assistance, the rest of the game should not be very hard.
Daniel Alvarado
Arleta, CA

The Eidolon: If you get all the gems on Level One, you won't need any gems for Levels Two or Three.
Norman Vaniski
Address Unknown

Epyx Baseball: When playing against the computer, if his player gets a base hit to the outfield, just stop next to the ball. When

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Reviewed by Scott A. May

Keith Van Eron's Pro Soccer

Computer: Commodore 64*
Publisher: Medalist International
80 Lakefront Drive
Hunt Valley, MD 21030
(301) 771-1151
Price: $34.95

No one can ever accuse MicroProse of limiting its horizons. The company synonymous with high-flying adventure has recently introduced a new label called MicroPlay, a division of the company's Medalist International series. The first release from this new division makes a surprise foray into the competitive world of sports software with *Keith Van Eron's Pro Soccer*. Prepare to get knocked for a loop when this powerhouse kicks on the afterburners.

Pro Soccer was aggressively designed by a British group known as Sensible Software. Expect to see a lot of exciting material in the future from this innovative team.

The game was created in cooperation with Keith Van Eron, goalkeeper extraordinaire, recently retired from the MISL's Baltimore Blast. His career highlights include being ranked second on the MISL's all-time goalkeeper wins list (133), as well as second in total games played (232).

The relatively small instruction manual is divided in two parts: The first deals directly with software options, gameplay and joystick control. The second half offers a history of soccer, as well as hands-on hints for the real thing from Van Eron and fellow MISL veteran Drago Dumbovic.

Aside from technical advice, Van Eron's greatest contribution to *Pro Soccer* is his spirited philosophy that above all else, it must be fun to play. The designers perfectly captured Van Eron's infectious love for the game. It has my vote for one of the most addictive sports games of the year.

Chief among the game's many attractions are the spectacular arcade-quality graphics. The game features a remarkable 3D, bird's-eye view of the action drawn with Amiga-like artistry. The trick lies in the European-style detailing, which calls for rendering the main characters in black outline. This relatively simple technique nets astounding results—brighter colors and sharper contrast between graphic elements.



The game melds fast, realistic action with extremely fluid player controls.

This graphic style also provides a showcase for the game's stunning top-down player perspective. As the characters tear up the turf, the field scrolls smoothly in eight directions. The screen reacts instantly to the location of the ball, not the ball carrier, for added realism.

During normal play, all we see of the on-field characters are the tops of their heads and jersey colors. Effective use of color highlighting and shading make the upper torso appear to be above the ground. Meanwhile, tiny arms and legs pump furiously at their sides. The effect is not unlike animated Foosball players. For a fleeting instant, however, when they attempt a tackle or dive for the ball, the outstretched body is revealed.

The ball itself heightens the 3D imagery. Various kicking styles send the ball sailing, often high into the air. When this happens the ball grows larger, tracing its shadow across the ground. More than just window dressing, the 3D, multilayered effect influences every aspect of play.

The arcade approach extends beyond eye-popping graphics. The game melds fast, realistic action with extremely fluid player controls. The result is a pulse-pounding game that's easy to play but challenging to master, especially against an opponent of equal stature.

Pro Soccer is actually two self-contained games in one package. The flippy disk features an indoor (MISL) version on one side and an outdoor version on the other. The manual outlines the differences between the two, some of which are quite dynamic.

The major variations are the field dimensions and team size. The outdoor version boasts 11 players per team and is played on a significantly larger field. The screen must constantly scroll to accommodate the large field. Arena soccer, with only six-man squads, is played in what seems like a fish bowl. In this version, both touchlines appear on the screen at once.

As users breeze past the title screen in search of the main menu, take a minute to admire the marvelous digitized soundtrack by Martin Galway. In fact, the music and sound effects throughout the game are far above average.

The main menu for both versions of the game offers a variety of options for one or more players. Medalist International Challenge pits a single player against a roster of 16 World Cup teams (outdoor) or six U.S. teams (indoor). Players begin at the bottom and attempt to work their way to the top. Initially, the computer teams are real pushovers, but gradually increase in strength. Complete the challenge in one sitting or save your progress to disk.

The next option offers Tournament Play for one or more human competitors. Select your team name and jersey color, then join in tournament play as the best teams are narrowed down through quarterfinals, semifinals and championship matches.

League Play allows up to 16 different people to compete over an extended period of time. The computer automatically keeps track of team names, point totals and league standings. The matchups and duration of league play are completely defined by the user.

Choose the Two-Player Friendly option for simple head-to-head matches. The F1 key swaps joystick control between players. Think of it as a training mode, when an experienced player runs roughshod over another. Finally, a demo mode allows players to study differences in tactics and strategy between the indoor and outdoor versions.

Basic gameplay consists of passing, shooting, blocking and tackling. Onscreen players gain control of the ball when extended contact is made. Once in control, dribbling is automatic. To pass or shoot the ball, simply press the fire button and move the joystick to initiate one of four kicks:

The Volley is a straight, fast, low-flying kick used mostly for passing. Its effectiveness as a shot is limited because it can be easily intercepted or blocked. Use it close

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Reviewed by Russ Ceccola

Tower Toppler

Computer: Commodore 64*
Publisher: U.S. Gold/Epyx
600 Galveston Drive
Redwood City, CA 94063
(415) 366-0606
Price: $39.95

It is believed by many that the towers were created for the purpose of evil—this you can't allow!



There are times when I really need a good computer game to relieve my frustrations. If I don't feel like going to the local arcade, I should be able to boot up a stress-reliever on my computer. Unfortunately, those kinds of games are really hard to find. Many games just don't "feel right." You can tell a good game when the moves that you make with the joystick feel like an extension of your hand. If any of the actions of your on-screen representative feel awkward, then the game is probably not one that you will play again and again.

I am happy to say that *Tower Toppler* is the type of game that I *will* play again and again. It's fun, addictive, challenging and unique. *Tower Toppler* comes to us from Europe through Epyx's agreement with U.S. Gold. Maybe there's something in the water over in Europe, but they seem to release arcade games left and right. The funny thing is that a lot of them are really good. *Tower Toppler* continues in that fine tradition of European artistry. It's a game that has a lot of neat features that make it worth adding to your software collection.

In *Tower Toppler,* you are an operative for the destruction company Destructo, Inc. Your mission is to demolish eight mysterious rotating towers that have appeared in the toxic ocean of the planet Nebulus. You do this by making your way to the top of each tower and setting the self-destruct mechanism. Your stay on each tower must be short, for a timer is quickly running down the seconds before you lose an operative. It is believed by many that the towers were created for the purpose of evil—this you can't allow!

In order to destroy them, you have to navigate your way to the top of each rotating tower by taking elevators, jumping over gaps in the ledges on the sides of the towers and destroying or avoiding all moving obstacles in your way. If you fall into the toxic ocean, you will die, so you must find another way to get between towers.

Fortunately, Destructo, Inc. has provided transportation in the form of an experimental MK.7 minisub. Use this sub to travel between towers and catch fish for bonus points along the way. As the action gets fast and furious, you will need to earn extra men to survive. By catching fish you can quickly amass enough bonus points to get another life.

Everything about *Tower Toppler* was excellently done, from the graphics to the tower design. Each tower has a name that describes its theme. The first tower is the Tower of Eyes. On it, you will come across many bouncing eyes that get in your way. You have to move at just the right time to get past them and make it further up the tower.

The second tower is the Realm of Robots. True to the name, you will find a lot of robots that move around in certain patterns on different parts of the tower. By watching these patterns for a few seconds and moving at the right time, you should be able to bypass these hunks of metal.

As you can see, each tower has a unique personality. Instead of just making each tower a harder version of the previous one with more obstacles, U.S. Gold used personalities to add flavor to the game, not to mention a reason for playing longer—to see what the later towers are like. Other towers include (in order of appearance): Trap of Tricks, Slippery Side, Broken Path, Swimmer's Delight, Nasty One and Edge of Doom (very difficult). (I only made it to the fourth tower.)

Each tower also has a lot of different obstacles associated with it. In addition to dissolving bricks and gaps in the path, you will encounter bouncing cannonballs, flashing blocks, elevators, paths through the center of the tower and mutant molecules that will follow you across the screen. These molecules are the most dangerous because they come up on you quickly unless you go through a tunnel or switch to a different level. They approach so frequently that you will begin to depend on their appearance. Eventually, you can figure out a pattern to make it up a tower and make it to the next tower.

If you don't have a good joystick, don't bother playing *Tower Toppler.* An unresponsive joystick just won't work because the game demands quick response. If you have a slow stick, get a new one. *Tower Toppler* tests the serious gamer; it shouldn't test your joystick as well.

The graphics in *Tower Toppler* are superb. Once again, a developer has pushed the Commodore 64 to the limit. (I often wonder if there *is* any limit to the functions and capabilities of this machine.) The neatest graphic elements are the rotating towers. As you move left or right around the circular towers, they scroll to the right or left, respectively, and it appears as if the tower is rotating. You will always see the view of your operative on the tower's ledges from a third-person perspective.

A clever bit of programming went into the routines that handle the rotation. Usually when a company makes a big fuss over a feature of a game, it turns out to be rather commonplace. That's not the case with *Tower Toppler*—the 3D graphics live up to all the hype.

The next best occurrence of outstanding graphic work is the representation of your character in the game—a seadog operative for Destructo, Inc. The game's graphic artists took that description of your alter ego literally and drew a "sea dog" on the screen. Your character looks like a cross between a frog and a small dog, retaining the color green. He has big eyes that are always looking in the direction of travel. If

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Reviewed by Russ Ceccola

Final Assault



Computer: Commodore 64
Publisher: Epyx
600 Galveston Drive
Redwood City, CA 94063
(415) 366-0606
Price: $39.95

You will often breathe a sigh of relief when you get to the top of a screen. What would you do if you ran out of food and just a few more meters to go?

Although computer games cover so many themes already, there are still a lot of areas left to explore. There have been adventure games, driving games, sports games, war games, science fiction games and games to cover most major human achievements, whether they be rooted in reality or fantasy. But until now, there hasn't been a game or simulation that captured the spirit of mountain climbing.

The idea behind *Final Assault* was to create a game that would capture on disk the thrills that are part of the dangerous and difficult sport of mountain climbing. To that extent, *Final Assault* works. You make movements with the joystick in three different scenes that help an on-screen climber make it further and further up the mountain of your choice. You will breathe a sigh of relief when the climber makes his way to the top, and you'll cry out loud when the character drops a few feet back down the rock face after losing his grip.

However, some of the movements that you have to make are a little too tough—the game is a little too picky. In order to understand where *Final Assault* goes wrong, you have to know a little more about the game.

Final Assault simulates a climb up a mountain trail of your choice. There are six possible trails in the regular game, plus a training course. You have to outfit yourself with all the provisions you think you'll need before you start the climb on a packing screen. Everything from chocolate bars to a snow shovel may be necessary for that long trip straight up. There are many items in the game that can be taken up the mountainside, but you have to be very selective. As a real mountain climber would do, you have to choose your provisions and equipment so that they don't weigh too much. With a heavy pack, you will be more likely to fall from the peaks.

On the packing screen, there is a picture of your pack. Depicted inside the pack are six objects and the word *NEXT*. By moving a cursor around with either joystick or keyboard, you can find out the name, weight and amount you are carrying for each object in the pack. By selecting the word *NEXT*, you are shown the next group of six items in the pack. This is how you find out what is in your pack before you start the game.

There is a default set of provisions to use for each trail and the training trail if you don't want to choose your own items. If you do want to make your own selections, a group of 16 icons pops up on the screen. These icons represent some of the objects that you can take along, like mittens or coffee. You can select as many objects as you want. Just remember to keep the total weight of your possessions under 25 kilograms and you'll do just fine in the game.

The default settings are enough to keep you going until you come to the top of the mountain. The real use for the customized packing option is to set up hypothetical situations. For instance, if you were wondering if someone could make it to the top of a mountain with only a certain amount of food and drink, you could try it in *Final Assault.*

There are two places that your inventory can be kept: inside your rucksack and on the rack of the rucksack. The distinction is that those items on the rack are available for immediate use. For instance, if you were climbing up an ice cliff, you wouldn't need soft shoes or chalk (used for rock climbing). Instead, you should put on your crampons (boot spikes). These are used to dig into the ice to get a good foothold. You put on the crampons by simply transferring them from inside the pack to the rack. This is easy enough to do. By pressing the space bar, a dot (cursor) appears on the screen. With it, you select one of two menus. One menu lists the items on the rack and the other lists those in the sack. By highlighting an item with the cursor and pressing the joystick button, you automatically move it to the other menu. Once you understand how to activate or use items, the rest is all downhill (so to speak).

To play *Final Assault,* you move a climber on one of three screens: up a rock face, up an ice cliff or across a glacier. In all screens, you can fall to your death. In the first two, this is obvious—you fall down the mountain by losing your footing. On the glacier, there are thin spots in the ice—on occasion, you may fall through. If you don't catch yourself when you do, it can prove fatal. However, the ice screens are the easiest to tackle.

Playing *Final Assault* involves repeating these three screens in a random order until you make it to the top. Because the game can be very picky about where you place your hands and feet on the more difficult levels, you will often breathe a sigh of relief when you get to the top of a screen.

Making it through the screens depends on how successfully you move the joystick in the correct directions, just like many other Epyx games. On the glacier, you simply move to the right and jump over visible crevasses, while at the same time checking for the snow-covered ones with your walking stick. On the ice cliff, you have to firmly plant your ice axes into the side of the cliff, set one foot in a safe spot, pull yourself up and then secure the other foot. On the rock face, the trickiest of all screens, you must use your soft shoes and rope to move carefully from crack to crack in the face, while avoiding boulders that occasionally tumble from above.

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Reviewed by John Pustai

Where in Europe is Carmen Sandiego?

Computer: Commodore 64
Publisher: Broderbund
17 Paul Drive
San Rafael, CA 94903
(415) 492-3200
Price: $39.95 (Consumer Version)
$49.95 (School Edition)
$89.95 (Lab Pack)

In the process of capturing Carmen and her gang, a lot of educational material is presented.



Where in Europe is Carmen Sandiego? is the third in a series that have become best-sellers among consumers and in the educational market. (Previous releases were *Where in the World is Carmen Sandiego?* and *Where in the USA is Carmen Sandiego?)* These award-winning programs teach social studies in a detective-story format. In this particular version, anyone can learn geographic, cultural, historic and economic information about countries of Europe. Because there is no time limit for the entire program, students and adults compete on an equal footing.

This game is similar to the first two games in the series, except that it is set in the 34 countries of Europe, and there are some new features. The object of the program is to solve crimes, advance to the top of the ranks and then catch the gang's leader—a graphically-cute lady called Carmen Sandiego. Carmen is more difficult to catch than other gang members. In the process of capturing Carmen and her gang, a lot of educational material is presented.

Players must accomplish three tasks to solve each case: (1) identify the criminal from the clues given, (2) issue a warrant for his arrest, and (3) track the thief to his final destination. In essence, the player must match up all information and clues to eventually catch the criminal. Solving each case takes time.

After solving a few cases, players are promoted in rank. The more cases solved, the higher the rank. Levels of promotion range from Gumshoe to Super Sleuth, with 11 levels in all. Once a player catches Carmen Sandiego and reaches "Super Sleuth" he or she has completed the entire game.

Two consecutive players will not get the same case to solve. But all players can get to the top of the ranks and will eventually get to capture Carmen Sandiego.

Your Assignment

The opening screen is the entrance to the ACME investigation office, and indicates "Humanoid at console. Please log in." Use the same name as in a previous case to open your file, so that you are assigned the same rank. If you have not played, the screen will prompt you to identify yourself. After you are "cleared for entry," you'll receive your assignment.

Assignments are straightforward. Once "inside" the office (next opening screen) you are presented with a ringing phone that you answer with the press of any key. A center window provides the assignment: "Gumshoe John, this is the Chief. I have just received a call from the Netherlands. A year's harvest of tulip bulbs has been stolen by a masked male. Head for Amsterdam right away. You must track the thief to his hideout and arrest him. You must apprehend the thief by Tuesday, 3 p.m. Good luck, John!"

Solving the Crime

The opening screen of your new case is divided into four segments. One segment shows the geographical location, the day and the hour. Another window offers moving graphics typical of the geographic location—for example, a windmill and a Dutch girl holding a dozen tulips. Still another window displays text about the country and city that you are in. A final window offers a choice of "Investigate," "Use Notebook," "Visit Crime Lab" or "Go to the Airport."

Cursor keys are used to make the choice. Normally, a player will chose "Investigate," which leads to three more options: "Question Witness," "Search Scene" and "Call Tipster." These choices use up the investigation time the program allocates to solve the case. The choices also provide geographical information about the movement of the thief to another part of Europe. For example, "He said he was going to spend the night somewhere between Nice and San Remo." If a player knows the answer, he or she will "Go to Airport" to follow the thief.

If the player doesn't know the answer, he or she can try to find it in the information in the included Atlas. Or the player can continue the investigation, this time possibly choosing "Search Scene." "You find a canvas bag containing a beach towel with a red and white flag on it" is one search-scene clue.

Still other options then are open. If you do not know what country has a red and white flag, you can "Visit Crime Lab." Choosing this option yields a different screen with four windows. The location and time window and options window remain the same. But there is a window showing a computer, and a window showing a printer, as well as choices that include "Use Database" and "Enter Crime Notes."

Choosing "Use Database" yields three icons—a flag, a bag with a money sign, and a cartoon cloud with "*Oui*" inside. These icons signify a choice of the national flag, the national currency and the national language—next to which there are options that are toggled by the right–left cursor. For example, if you chose a red and

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Reviewed by Morton A. Kevelson

1581 Toolkit

Computer: Commodore 64
Publisher: Software Support International
2700 N. E. Anderson Road, #A-1
Vancouver, WA 98661
Medium: 3.5-inch Disk
Price: $39.95



1. The 1581 Toolkit main menu screen



2. The 1581 Toolkit Track and Sector Editor

The 1581 DOS Reference Guide, which is part of this package, should be required reading for all 1581 hackers.

Disk management is an important, but often neglected, aspect of personal computing. The only way to insure against the irretrievable loss of data is to scrupulously maintain backup copies of all disks and files. Finally, improved productivity is a side benefit of proper file maintenance as it becomes faster and easier to find what you are looking for.

The 1581 disk drive is the latest and greatest floppy disk drive for the eight-bit Commodore computers. With more than 800 kilobytes of storage along with the ability to manage subdirectories, or partitions, it has revolutionized the way Commodore 64 and 128 users store their data. The importance of proper disk maintenance has grown in proportion to the 1581's expanded storage capacity. After all, the amount of data that could be lost with a single 1581 disk is equivalent to what can be stored on nearly five 1541 format disks.

The most often-cited reasons for not observing proper data maintenance are the time required and the inconvenience associated with doing a thorough job. Thus, it is important that a good backup program be fast, easy to use and resistant to user errors. The *1581 Toolkit* comes very close to meeting all three of these criteria when used with the 1581 disk drive. Although the *1581 Toolkit* is supplied on a 3.5-inch floppy disk, it supports the 1541 and 1571 disk drives for file maintenance. (Of course, the 1541 and the 1571 do not support the 1581's directory partition feature.) The *1581 Toolkit* is not copy protected. Nevertheless, it cannot be transferred to the 5.25-inch disk format as the program makes extensive use of direct disk access for most of its overlays.

If you have a Commodore 128 and your 1581 is set up as device number 8, you can autoboot directly from the distribution disk. This is obviously not the case for 128D users where the 1571 is built into the computer and hardwired as device number 8. However, it will not be necessary to change the device numbers on any of your disk drives to use the *1581 Toolkit.* Simply go to 64 mode and LOAD":*",n,1 where n is the device number of your 1581 disk drive. The *1581 Toolkit* will remember this device number and it will always go back to it when the program disk is required.

The *1581 Toolkit* consists of ten modules, all of which are accessed from the main menu. With the exception of the installation of the Fast Loader module, you can always return to the main menu from any of the program modules. The program is very easy to use as all of its functions are accessed via on-screen menus. Common to all modules is the ability to view the disk directories and to issue disk commands.

Both single and dual drive whole disk copiers are provided. These only work with the 1581 disk drive. With two 1581 disk drives an entire disk can be copied in about two minutes. With only one 1581 disk drive, the backup process takes about ten minutes, but it also requires 16 pairs of disk swaps. Unfortunately, the *1581 Toolkit* runs only in 64 mode. It does not utilize the additional memory in the 128 nor does it recognize the extra RAM in the 1764 or the 1750 RAM expansion modules. With the whole disk copiers you can copy a part of a disk by selecting the starting and ending tracks. This can be useful for salvaging data or for repairing damaged disks. The whole drive copiers verify the data as they read and write. Errors are reported with regard to the disk on which they occurred and the affected track.

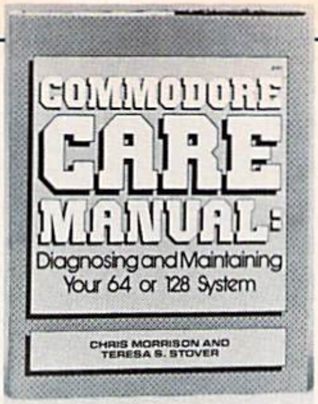
The Fast File Copier module supports the 1541 and 1571 disk drives in addition to the 1581. On the 1581 you can select the partition which will be used as the source or the destination for the files. You can even copy files from one partition to another on the same disk. If you are using two disk drives, you will find the Fast File Copier very efficient. I was able to copy 702 blocks, consisting of 19 files, in just two minutes, 35 seconds from a 1571 disk drive to a 1581 disk drive. If you are working with a single disk drive, you will have to swap disks in proportion to the data being transferred, as the data buffer is limited to the capacity of the 64's RAM. If you have two dissimilar drives and wish to copy a lot of files to the same format disk, you will probably be better off using a scratch disk as an intermediary rather than doing a single drive file copy. The Fast File Copier module lets you easily delete files and format disks in any of the supported formats.

Note: the Fast File Copier will handle only program and sequential files. Relative files can't be copied with this module.

The Directory Editor module lets you rearrange or reorganize the 1581's disk and partition directories. The file name, type and status can be easily changed. Dummy files, to be used as separators, can be easily created. Groups of files can be sorted in numerical and alphabetical order and files can be manually rearranged. Partition directories can be manipulated with this module, but you have

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Reviewed by Mike Rivers



Commodore Care Manual:

Diagnosing and Maintaining Your 64 or 128 System

Written by: Chris Morrison and Teresa S. Stover
Publisher: TAB Books
Blue Ridge Summit, PA
17294-0850
(800) 822-8158 (717) 794-2191
Price: $16.95

The *Commodore Care Manual* is a diagnostic and maintenance guide for the user who wants to know more about downtime problems they can fix and how to identify ones that require a service center. It covers not only the computer, but also peripherals common to typical personal computer systems. Each chapter includes a clearly written, easy-to-understand description of the device under discussion, its function, troubleshooting and repair guidelines, and solutions to possible failure modes.

The entire text is written for the user who doesn't have any knowledge of electronics or access to test equipment. Sound familiar? Maybe this book is for you. Even if you don't have an ailing computer, reading the *Commodore Care Manual* will give the inexperienced user an intuitive sense of how a system in good repair should function, and what you can do when it doesn't.

Chapter One describes a diagnostic and "exerciser" program for the Commodore 64 and 128 systems and their peripherals, including the keyboard, monitor, printer, datassette, disk drives, modems and serial port. The program is not a "component level" (i.e., microchip) diagnostic, but does a good job of testing the devices mentioned. Every function of the program is described in detail for both 64 and 128 systems, and a listing is provided at the back of the book. A section called "Tools and Resources" which lists the basic tools needed to maintain a personal computer and perform simple repairs. A checklist is provided to help you assemble what you need before you attempt to understand the seemingly unknowable, namely: "What's wrong with my computer?"

Chapter Two deals with the "system unit" and the keyboard. The system section covers what to do if the unit does not appear to be functioning. It includes a procedure for disassembly of the computer and keyboard, as well as a thorough description of how the keyboard module of the diagnostic program works. This section of the program looks fairly rudimentary, but will help you nail down which keys or combination of keys may be malfunctioning, and since the program also verifies key closure by printing the ASCII code of the key pressed, you will know whether or not it's the keyboard that's having problems, or some other part of the computer.

The procedures mentioned in this chapter may prevent an unnecessary service call; who among us hasn't had a household appliance which appears to be dead that only needs to be plugged in?

The chapter on monitors allayed my reservations concerning the scope of this book. Since the display can tell you a lot about how the computer is working, the authors have taken the care to mention the relationship between the keyboard, the character ROM and the monitor. If you press a particular key and don't get a character on the screen, is it the keyboard or the ROM that's in trouble? Knowing this is invaluable, both before and *after* a visit to a repair center, and the information is presented so that the reader can understand what's going on with the equipment without being baffled by technical information only an electrical engineer could love. This chapter also includes raster alignment, color testing, scrolling and sprites.

Printers are covered in Chapter Four, which contains a fairly detailed discussion of printer codes, their functions and related problems for dot matrix and daisy wheel printers. Printers can be confusing even for the experienced user; the programming section of this chapter can be enlightening if you have problems getting your printer to do what you want it to, even if there's nothing wrong with it.

Chapters Five and Six deal with the datassette and disk drives. The sections on error codes and troubleshooting are well written and informative. If your drives seem to be ill-behaved, Chapter Five gives plenty of practical suggestions for determining if it's the drive or the user that's malfunctioning. These chapters are recommended reading for anyone.

RS-232 modems, telecommunication data and modem protocol are the subject of Chapter Seven. We're shown how to make a "loopback" connector to test a non-VIC (RS-232-type) modem and how to use it. If you're a telecommunications enthusiast and you've ever wondered what that little box connected to your phone line is doing, you'll find this section interesting.

The next to last chapter, "Burn-in and Post-Repair Testing" gives you the ability to "exercise" a unit or peripheral so you can make sure it's going to stay fixed.

Chapter Nine gives suggestions on writing your own tests for other devices, with a joystick given as an example.

At first, I felt that the book was a little sketchy concerning the computer itself. Nothing is said about individual testing of RAM, ROMs, the system clock, RF module, etc., but this is *not* a technical service manual. If something is wrong at the component level, few owners can do anything about it except find a service center.

The authors stress having your system documentation handy because differences in revision levels are not addressed. For example, in the case of changing disk drive device numbers, a more recent version of the 1541 is used as an example, so those with older drives will have to refer to their 1541 System Guides for the correct procedure. This is not surprising considering the number of different types of peripherals mentioned.

The *Commodore Care Manual* is well written, easy to understand and informative without beating you over the head with unfathomable technical detail, and it covers the entire system, including peripherals. After running the diagnostic program and referring to the related chapter, the user can usually tell the difference between a problem with the computer itself or a problem with a peripheral. This is a good book for those who have had their computers and peripherals "in the shop" only to find there's nothing wrong. It's also handy for those who do have something wrong and want a clear understanding of what needs repair before servicing.



Queen Victoria

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Reviewed by John Ryan

Test Drive II: The Duel

The Supercars California Challenge

Computer: Amiga*
Publisher: Accolade
550 South Winchester Blvd.,
Suite 200
San Jose, CA 95128
Price: $44.95 *(The Duel)*
$19.95 *(The Supercars)*
$19.95 *(California Challenge)*

My secret weapon for initially sizing up *Test Drive II: The Duel*, while not quite as scientific as other methods, involved a much more reliable litmus test: my ten-year-old son. Once I hear the words, *rad*, or *big time!*, I know I've got something worth looking at.

Yes, *Test Drive II* is indeed rad, for lack of a more sophisticated term. *Test Drive II* seems to be quite an improvement over its earlier version. *The Duel* places you in the cockpit of either a hot Ferrari F40 or Porsche 959. Unlike other racing games, however, the view from these expensive cockpits falls on that extremely thin line between rad and big time. Not only will the beautifully detailed instrumentation (right down to the leather upholstery) have your heart beating faster, the first-person view out the windshield surely stretches the Amiga to its limits—if such a feat is possible. This game, if nothing else, may very well become the *Flight Simulator II* of the racing genre.

But let's talk about differences. Where *Test Drive* pitted you against the stopwatch and limited you to a few stretches of rather mountainous (read monotonous) highway, *Test Drive II* offers head-to-head competition against the computer. Moreover, Accolade must have listened to complaints that the original *Test Drive* lacked the depth and scenery needed to really do the program justice. This time they've simultaneously released two support programs: *California Challenge*, a scenery disk that allows you to race from the California–Oregon border, all the way to the blistering deserts of Mexico; and *The Supercars*, contains five additional premier sports cars, all of which have varying degrees of performance and handling.

Once past the opening screen, you are



presented with a splendid menu that permits the scope of the game to be set. If you own the *Supercars* and *California Challenge (CC)* disks, you'll first want to use the install options to inform the program which disk drive to access them on. (While not a must, using at least two disks drives for this program will speed things up immensely.) The install option will also allow you to set up a play disk. Hard drive owners take heart: *Test Drive II* will allow you create play disks on your drives as well.

Once you've selected the cars for the race, you must specify whether to play against the clock or the computer. By racing against the clock you can get a good feel for how each car handles, check out the scenery and become familiar with the layout of the road, all without the pressure of a computer opponent dogging your tail. Try to do the speed limit the first time out; it will probably be the last time you really get to look at the scenery!

The difficulty level of the game is selected by moving a slider across a multicolored scale. At the lower levels, all shifting is automatic, so you won't have to worry too much about keeping a wary eye on the tachometer. At the more advanced levels, however, shifting becomes an integral part of the game. "Red line" your tach too many times, or downshift to an inappropriate gear, and—more than likely—you will blow the engine out of your sleek machine (resulting in a costly penalty). Additionally, the level you select will ultimately determine the top-end speeds of both your computer opponent and highway patrolmen. It will also determine the traffic density on the roads, the speed of the traffic and scoring percentages.

The detail behind the wheel is magnificent. The full instrumentation in the cockpit includes a working speedometer, tachometer and gas gauge. You will also find a stick shift, radar detector and a race leg gauge, used to display your position in relation to your competitor and any police who may be skulking about. Against the computer, you won't have time to study the cockpit too long; that image growing in your rear-view mirror means business. Dally too long and you'll find yourself eating dust and taillights.

Push the joystick forward to accelerate; press the joystick button to shift. Pull the joystick toward you to accomplish the opposite. Knowing when to shift to a higher gear becomes rather obvious after a while. If the car's engine begins to whine too loudly, simply check out the tachometer. You can bet that if your tach needle is pegging red, it's time to shift.

Knowing when to downshift, on the other hand, will take some getting used to. Timing is the key here. As you come upon curves or slower traffic ahead of you, it is not enough to simply brake, for once you attempt to accelerate again, you may find yourself with little or no power. Downshift once. If you still don't have enough rpm's, try the next gear down. The worst mistake you can make is to hurriedly shift down three or four gears in rapid succession—especially when traveling at a high rate of speed. If you attempt this, you can kiss your engine goodbye, Mario.

The race is composed of separate "legs." Each leg presents different driving hazards to contend with. While one leg may see you navigating a twisting mountain road, the next may have you negotiating a heavily traveled desert highway. The scenery is like that of a good flight simulator. As you move down the road at speeds of up to 200 mph, this "you-are-there" perspective conveys a very convincing sense of movement.

The acceleration is smooth, and the scenery scrolls by on each side of the car at a rate consistent with your speed. Moreover, this scenery is not just a line of repetitive landmarks that happen to show up at regular intervals. The viewing in *Test Drive II* is much more spectacular, especially if you invest in the *California Challenge* disk, which offers seven scenery areas in addition to the three offered on the master disk. With the scenery disk, you can race from the from the lush forests of northern California, down through San Francisco and on to the Mexican Border.

If only racing were so straightforward. Negotiating the road is just one of the problems you'll face here. Depending on the level you select, you must also deal with slower traffic, for not only will you find traffic traveling in the same direction you are, but coming toward you as well. So

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Reviewed by Jay Kee

Sword of Sodan

Computer: Amiga*
Publisher: Discovery Software
163 Conduit Street
Annapolis, MD 21401
(301) 268-9877
Price: $49.95

From the developers of *Arkanoid, Sword of Sodan* is nothing short of a visual sensation. One of the best arcade games to come out for the Amiga in a long time, Discovery Software has combined gorgeous artwork, silk-smooth animation and superbly digitized sound in a package that is as entertaining as it is challenging.

The game's premise is nothing new—an evil wizard with a real attitude problem has taken over the kingdom. Your father, the king, has foolishly taken exception to this, and the wizard cancelled his ticket. Of course, family loyalty being what it is, the king's heirs (that's you) have vowed to avenge his death and restore peace to the kingdom.

The plot may sound familiar, but the game has a number of new wrinkles that, aside from the quality of the graphics and animation, put it into a class by itself.

For openers, instead of the standard muscle-bound barbarian you'd expect to find, you're given the choice of two characters—a male or a female (a new twist that's almost certainly aimed at attracting more female buyers). But don't get the wrong idea; this is *not* an RPG (role-playing game). You have no control over the character's race, class or attributes. What you see is what you get.

Once you've selected the character, you start out in the courtyard of your father's castle and, armed only with a sword and your wits, set out to fight your way into the inner sanctum, there to confront and (theoretically) destroy Zoras.

Of course, you're given more than one life to start (it'd be a *real* quick game if you had only one), and you can acquire more as you progress. In between lives, you encounter an incredible array of strange creatures and weird warriors, each meaner, uglier and nastier than the last. And while you may get hammered a lot, you'll *never* get bored!

The terrain is just as . . . interesting. You have to pass through a forest, survive



The plot may sound familiar, but the game has a number of new wrinkles that put it into a class by itself.

a booby-trapped gateway and somehow get through a graveyard full of zombies before you even *get* to the castle. And while all this is happening, daylight is fading and night is closing fast.

Along this twisted path, you'll find various potions that will give you extra strength or extra lives, kill opponents or create a temporary magical shield—all items that you can carry with you until the need arises; and the need arises with alarming regularity. Every level has traps you must find and beat, tasks that must be completed, puzzles to be solved or moves that must be performed within a time limit—all in addition to the monsters that are constantly doing their level best to turn you into hamburger.

Of course, like everything else, wisdom comes from experience and experience comes from screwing up. And *Sword of Sodan* provides loads of opportunity for screwing up! Fortunately, the game designers provided a neat little trick called "Instant Replay." If you have one megabyte or more of memory, instant replay can be selected after your untimely demise. This option will reenact your journey from start to finish. In this way, you can study a particularly tough trap or opponent and develop a technique or strategy that will work. If you *don't* have additional memory, don't despair! The task is not entirely hopeless . . . just a lot tougher. (But since when has *tough* ever bothered a dedicated gamer?)

Just in case you survive long enough to achieve mediocrity, the game designers thoughtfully included a "Hall of Fame" where your achievements can be stored and displayed for all to see. (The way I performed, it could easily be renamed the "Hall of Shame"!)

One last note, *Sword of Sodan* is heavily copy protected, but unlike some other software products, it *doesn't* crash and burn on an Amiga 1000. But be warned: *Sword of Sodan* is a three-disk monster and *loves* RAM; if you don't have a megabyte or more of RAM and two drives, be prepared to do a *lot* of disk swapping and memory crashes!

In summary, *Sword of Sodan* is a beautiful piece of work, enticing and thoroughly entertaining. There's enough happening here to keep veteran players toiling into the wee hours for weeks. If there's a discouraging word to be found anywhere, it has to be on the violent nature of the game. Some of the action is graphic and quite gory and *not recommended for children!* If software were rated the way they rate movies, this one would definitely be R-rated.

**An MS-DOS version of the program is also available. A Commodore 64 version is planned.*

Next Month in Commodore Magazine

Data East USA

First they made arcade machines, then pinball machines, and for the past three years they have been making computer games. You probably know the games: *Bad Dudes, Batman, Karnov* and many others. Now take a look at the company. Who are the people driving this successful software company, and what do they have planned for Christmas?

Heidi Turnipseed: The Amiga's Disney Animator

Heidi started her career as an animator at Disney working on such films as *Robin Hood* and *The Fox and The Hound.* She left Disney to follow Don Bluth and continued her animating on films such as *The Secret of NIMH* and *An American Tail.* Now she is an independent animator and relies heavily on her animation computer . . . the Amiga. Here is the story of Heidi and her Amiga.

PC40-III: A Compromise of Superlatives

Earlier this year Commodore released the PC40-III, a PC/AT-compatible computer with 1MB of RAM, a 40MB hard drive and lots of other goodies. This is a comprehensive look at what this machine has to offer, and what it lacks, in the crowded market of PC/AT-compatible computers.

Available on newsstands August 22, 1989.

Reviewed by Russ Ceccola

Galactic Frontier

Computer: Commodore 64
Publisher: Free Spirit Software, Inc.
P.O. Box 128
58 Noble Street
Kutztown, PA 19530
(215) 683-5609
Price: $14.95

How many times have you watched *Star Trek* and wished you were the one sent to investigate new worlds and seek out new life and civilization? I speak for many when I say that I've always wanted to visit different planets in the galaxy and learn more about this world in which we live. We would-be space explorers are in luck because a new game from Free Spirit Software lets you do just that. *Galactic Frontier* is a very impressive program that lets you visit as many of the 200 billion possible stars in the Milky Way as you'd like.

Galactic Frontier is both fun and educational. Because of the way the game is presented, you learn about how planets and stars are related as well as all sorts of characteristics about both. Your ultimate goal is to find life forms on planets somewhere in the galaxy. You are awarded points for each life form you discover. Along the way to this goal, you will explore many different sectors of the galaxy, examine stars and planets and guess about the probability of life on certain planets before you fully explore them.

When I first opened the package and saw the miniscule manual (seven pages), I thought I was in store for some cheapo public domain program being distributed by an established company. Boy, was I surprised! Although the manual is small and the packaging rather plain, *Galactic Frontier* is an excellent way to spend time with your computer when you don't want to think too much yet want a bit of a challenge. *Galactic Frontier* is the type of game that I like to play when I'm in a heavy thinking mode (about life, the universe and everything) and want to escape from reality for an undetermined amount of time by doing some serious gaming.

Now that you think that I'm crazy, let me explain further. After playing *Galactic Frontier* for an hour or two, you can pick

Galactic Frontier is an adventure game of the greatest proportions because you truly are exploring the unknown.





out those stars that might have life-supporting planets revolving around them. When you get to this point with the program, the challenge is increased. Your goal is not only to find life, but also to discover life forms on planets without wasting too much exploration time. *Galactic Frontier* is really an astronomy program with some added features that make it a game. *Galactic Frontier* is an adventure game of the greatest proportions because you truly are exploring the unknown.

It is very simple to play *Galactic Frontier*. Although the manual is short, I suggest playing the first few times with the manual by your side until you get used to the astronomical terminology. Your options in the program are few. Basically, you choose whether to jump (warp, whatever you want to call it) to a new sector in the galaxy. When you make it to a new sector, the program tells you how many stars are in the sector and asks you if you want to examine the first star. If you don't want to examine that star, it picks the next one on the list and asks you again. The process repeats until you journey to a star or you run out of stars in a sector, after which you are automatically "jumped" to a new sector.

Once you go to a star, *Galactic Frontier* shows you a picture of the star and tells you how many planets revolve around the current star. You choose planets in the same way as stars until you run out. In both cases, *Galactic Frontier* gives you all sorts of data on the star or planet that you have selected. This information will help you determine whether the planets around the star can support life. For each star you choose, the following statistics are provided: spectral class (letter that indicates composition, heat and color), spectral number (where a star is in a spectral class), luminosity (brightness), type (whether the star is a red dwarf, giant, supergiant, etc.), spectroscopic analysis (chemical makeup of star), diameter, temperature and age. For all of this data, the star is compared to our sun's data to show how close the star can be to supporting life-giving planets.

As far as planet data goes, there are a lot more points to consider. As with the star, the planet of your choice is also compared to something we know about—our planet Earth. The numbers and descriptions given are compared to correlating data for Earth. This is how you determine whether the planet supports life or not. After all the information has been revealed for a planet, the ship in which you are traveling releases some pods to search for life.

The following data are reported for each planet: planet's distance from the star, number of moons and their visibility, color of planet, chemical analysis of atmosphere, solids and liquids, length of year, length of day, volcanic activity, temperature (high, low and average), atmospheric pressure, wind speed, wind pressure, sky color and (at the end) life forms. The program builds to a climax by leaving the search for life forms until all the informa-

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Reviewed by Nick Wild

Hostage: Rescue Mission

Computer: Amiga
Publisher: Mindscape (Infogrames)
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667
Price: $39.95

The sound of shattering glass breaks the deadly silence as you swing through the window, take deadly aim at the terrorist and open fire. Caught totally by surprise he has no time to respond and is thrown backwards through the door. You motion the hostage to follow you, and so begins the long journey to safety.

Hostage: Rescue Mission brings a current topic—terrorism—to the computer screen. The game begins with a view of an embassy. Seconds later a car races to the side of the building and screams to a halt. Several terrorists leap out and overrun the building. You are placed in command of all six members of an elite anti-terrorist squad. You'll have to use all of your skill and cunning to counter these madmen and win one for democracy.

Before you begin the game you must complete the copy protection check by entering a specified word from the manual. After finishing the check, you are then asked to select your level and mission. Four missions—Target, Ultimatum, Assault, Rescue and a training level with no hostages—can be selected at any time. You can not select a higher difficulty level until you have finished all the missions playing at your current level. When you have succeeded at all five missions on any level, you get a code word that lets you begin on the next level of difficulty.

The first task you are faced with is putting your three snipers (code names Delta, Echo and Mike) into position. The display changes to show a street-level view of the blocks surrounding the embassy. Using your joystick you must move your men to their assigned positions under the cover of the night.

Sound easy? Well, if you said yes, you forgot about the machine gun-toting terrorists across the street! They constantly scan the block with spotlights. To avoid becoming Swiss cheese you must crawl,



roll and run to avoid the lights. If things get too hot to handle, dive into a doorway or window to catch your breath and check your map.

Excellent sound effects of gun shots and ricocheting bullets will have you ducking! If one or more of the men buys the farm, don't fret, you can repeat the stage as many times as you'd like or continue on to the second stage.

With your snipers in position it's time to send in the commandos (code names Hotel, Tango and Bravo). Once again the action is set up by a cinematic "act." You watch through a TV camera as a helicopter carrying the men flies over the Embassy and the men rappel down to the roof.

After the helicopter flies off, a bird's-eye view blueprint of the embassy appears, Markers show the location of your men. If you select a sniper, the view changes. You will see a picture of your man aiming his high-powered rifle. In the lower-right corner the view through the scope is shown, you can move the aim around and look for terrorists to pick off. Realistically, the rifle shakes slightly as you scroll around the building. After you've finally gotten a bead on a window, squeeze the trigger (joystick button) and say "so long" to the glass and anyone standing behind it.

Using the snipers is not trouble free. People in the windows appear only as silhouettes, so you have to be careful that you're not gunning down innocent people. To avoid this mistake have some of your men scout out targets for the guys outside.

Once your snipers have picked off as many of the terrorists as they can, it's time to send in the commandos to do the real dirty work. Since storming the front door would be suicidal, these three simply rappel off the roof and enter through a window. To accomplish this you must first decide where you want your men to descend. Next you must control their descent using the joystick—make sure the terrorists don't see them. If they are spotted they're in for a big fall! If things get too hairy, the snipers can always be called in to provide some cover fire.

Once your men are inside, the game play changes again. This time the three-story embassy is displayed from the inside. If your character is in a hall, a first-person view is shown. When your man enters a room, the action is viewed from a third-person standpoint.

If you spot a terrorist, open fire—fast! The terrorists will shoot with no hesitation, so you'd better keep your finger on the fire button—you're going to be using it a lot! Upon opening fire you can direct the gun's aim. Accuracy is a must at times. Terrorists will often use hostages for cover. Dust a civilian and you're in *big* trouble.

Movement is done in steps; instead of scrolling, the display rapidly changes to show your new vantage point. Terrorists move in an identical manner. You'll find these bad guys play things smarter than most computer opponents. They usually track and attack you with good strategy, hiding for the ambush, using the hostages for cover and following the sound of your gun fire. Study their strategies and you can force them to play into your hands; somehow it seems they can always find a way to surprise you, so never relax. To win, you must lead all of the hostages individually to a room on the third floor, or eliminate all of the terrorists.

The music keeps the suspense high, while the well-done and occasionally horrific sound effects will have your neighbors wondering if you're training a battalion in you're basement.

After the game has ended, an assessment of your performance is given in the form of a newspaper article. If you feel your efforts were inadequate you can replay any part of the mission.

Hostage: Rescue Mission is the perfect game for those looking for that extra something to go with fast action. Carnage can be heavy at times, parents may want decide if it's appropriate for younger children but when compared to some other games and TV, the game's violence is not that bad. While the action is varied, it might have been nice if the embassy had different floor plans or hostages were taken in different settings. Despite this, Amiga owners should find this fits the bill as a high-quality game. Hint: keep a member of your team in back of the door to the "safe" room; this will prevent terrorists from sneaking in and harming the hostages when you're not looking.

Reviewed by Steve King

DeluxePaint III

Computer: Amiga
Publisher: Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
(415) 571-7171
Price: $149.95

Undoubtedly everyone reading this review has either used or seen *DeluxePaint II*. After all, the burning philosophical question "Which came first—*DPaint* for the Amiga or the Amiga itself?" is still being debated by computer hackers worldwide. It's been four years since the original *DeluxePaint* was released; since that time Electronic Arts has demonstrated its support of the Amiga by working diligently to refine *DeluxePaint*.

That endeavor has culminated in the release of *DeluxePaint III*, and in my opinion, the wait was well worth it. At first blush, a look at the main screen reveals no changes whatsoever. But behind that screen, Electronic Arts has included some powerful new features. The remainder of this review will concentrate on the improvements to some of the existing features and the additional functions added to the new version of *DPaint*.

While *DPaint III* still does not support HAM images, it has been modified to support Extra HalfBrite mode. This mode (on all but some of the older Amiga 1000 models) gives you 64 colors, 32 of which are half the intensity of the first 32 colors. For video applications, the program provides an overscan mode (full screen display) as well as a screen as large as 1008 × 1024 pixels.

The Brush functions have been expanded to include a mode where any custom brush will be outlined with a user-defined color. This feature works best with brushes containing lettering.

You have the option of selecting which palette color will be transparent. There are also some improvements in the tool features. For example, lines, circles and rectangles can be drawn with dotted or solid lines, merely by making the appropriate adjustment in the new "Spacing" requester. You can now draw these shapes using the airbrush tool.

The "Fill" requester also has some new features, the most artistic of which is the "wrap" option which, in effect, wraps one of your custom brushes around any shape that is being filled. Unfortunately, you still can't print text in gradients (you must fill each letter after you print it), and the fill function doesn't fill in the area which is covered by the menu bar and toolbox. Moreover, when you load in pictures where the lower register colors are very dark, the toolbox (which uses the initial colors) also becomes dark and invisible. Perhaps the next revision will contain a feature that changes the colors whenever you move the mouse pointer over the toolbox area.



Perhaps the most impressive and powerful addition to *DPaint III* is its animation capabilities which are based on a technique called "page flipping."

There are also additional controls in the "Print" option which control the placement of the picture and allow you to print the black background as a white area. The perspective option has been expanded, and the manual explains the process in greater detail than before. And last but not least, the program will finally access additional fonts which are not in the default font drawer of your boot disk. In fact, the font requester even has a feature which displays the letters of the selected font in the requester itself!

Perhaps the most impressive and powerful addition to *DPaint III* is its animation capabilities which are based on a technique called "page flipping." Simply speaking, if you take a series of pages (or frames) on which objects are drawn at slightly different positions and display them rapidly, those objects will appear to move. Moreover, if those objects change their shape from frame to frame, they will change in both appearance and position.

While this technique is not unique to either *DPaint III* or the Amiga, the program's ability to automatically move your objects in any of three axes and directions is quite outstanding. This feature is particularly useful in video titling applications, as the results are quite good and the rendering time is extraordinarily fast.

To begin animation, you first select the number of frames you want to use. At the maximum playback speed of 30 frames per second, movement of an object over 30 frames will last one second. You also have the option of changing the playback rate, although the faster you go, the smoother the animation (but the more memory you need). Once you select the number of frames, you place the object you want to animate (usually in the form of a brush you have created) on the screen.

For example, you can load a large-sized font and write the word *Amiga* and then pick it up as a brush. Now, to make the word start as a small speck in the background and appear to move towards you while gradually becoming larger, simply select the Move option from the Animate menu. You will then be shown a requester box where you can set the distance (in screen pixels) you want the brush to travel over the course of the 30 frames. In fact, you can move the brush in any or all three directions simultaneously. By using the Angle settings, the brush can also rotate, roll or spin while it is moving! A preview button permits you to quickly see (in outline fashion) the movement of the brush. When you are satisfied click on "Draw," and the computer will rapidly draw each of the 30 frames. When finished, you can press various keys on the keyboard to play back your animation and use the left and right cursor keys to change the playback speed in real time.

The next great feature is what Electronic Arts calls an "animbrush," which is short for "animated brush." Brushes usually bring to mind static graphic objects which you pick up with the mouse. If you select the Pick Up menu item, the area you surround is not only the current frame you see, but a rectangular slice of all 30 frames you have created. Now when

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Reviewed by Steve King

Pro Sound Designer

Computer: Amiga
Manufacturer: Precision Software, Inc.
8404 Sterling Street
Suite A
Irving, TX 75063
(214) 929-4888
Price: $159.95



In reality, the technical capability of the Amiga to capture and play sounds exceeds its ability to capture and display pictures.

When we hear the word *digitize,* most of us immediately think of video cameras and HAM images. But microphones and audio samples would be just as appropriate, as the Amiga is an ideal tool for capturing and playing sounds. Unfortunately, audio digitizing has taken a back seat to video digitizing, perhaps because it is less glamorous. But what's an exciting game without explosions or rocket sounds? And how could any of the popular music programs play songs without the sounds of digitized instruments? In reality, the technical capability of the Amiga to capture and play sounds exceeds its ability to capture and display pictures.

Pro Sound Designer, distributed by Precision, Inc., is dedicated to capturing, editing and playing high-quality sounds. The package consists of a small electronic device which plugs into the Amiga's parallel port and a software program. Precision has also included a hardware adaptor to accommodate all Amiga models. The interface has a subminiature jack and is pre-set at the factory to accept a stereo audio signal from the headphone (not speaker) output of almost any audio device. All you need is a cable with a male subminiature stereo plug on one end and an appropriate plug on the other. Unfortunately, there doesn't appear to be such an animal, so you'll probably have to gin up your own substitute using standard audio cables with various adaptors at each end.

The device itself translates analog audio data (in the form of varying electrical strength) into discrete numbers—a language a computer understands. It feeds those numbers through the parallel port for storage in memory. To produce a crystal clear, noise-free signal, the hardware doesn't contain any preamps, and requires a high-level signal to function. Because of this, you can't plug a microphone directly into the interface, but instead must route it through a high-quality preamp (such as that found in a tape deck which almost everyone has). You also have the option of internally adjusting the hardware to accept line level output signals which should remain constant from one audio device to another. While you have to open the device to do this, the adjustment is quick and easy, although it does require a small allen wrench.

When the program boots, the first thing to do is select the type of audio digitizer you are using since the software was designed to work with several popular digitizers other than the one sold by Precision. After you make your selection, the Main Screen appears as a slick, graphic control panel. There is one large blank screen in the center called the "Waveform Display Window." This acts as an oscilloscope, displaying the incoming sound level of both the left and right audio channels in real time. A second rectangular window runs the horizontal width of the panel. This is the Sample Display Window which shows a graphic representation of the particular sample you select.

Depending on the amount of memory you have, the program can hold up to eight monophonic samples or four stereo samples at any time. Each sample is assigned to a graphic button, a function and numeric key, as well as to one of the Amiga's four sound channels. Prior to recording your sample, simply select one of the eight available buffers, and click on the monitor button. You now have a choice of either hearing the actual digitized sound being fed into the computer in real time, or watching it in the Waveform Display Window. You must also set the recording frequency, which is the number of times per second the hardware samples the incoming sound. *Pro Sound Designer* can sample up to 28khz, or 28,000 times per second. For normal use, select 8 khz which may produce a lower-quality sound (good for sound effects, etc.) but takes up less memory. The higher the sampling rate, the better the quality but the more memory used. A five-second sample digitized at 28,000 khz will occupy about 140K of memory (5 × 28 khz), while the same sample recorded at 8 khz will occupy only 40,000 bytes.

Finally, click on the "REC" button which puts you in the monitor mode, so you can hear what will be digitized. Press the left mouse button to start digitizing, and again to stop (if you haven't already run out of available memory). To play back what you have recorded, just click on the "PLAY" button or press the key corresponding to the buffer you have selected. By clicking on the "Reverse Play" button, your sample will be played backwards, and if you enable the loop function, the sound will repeat itself continuously.

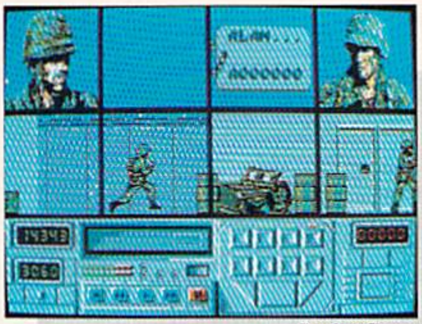
Once you have captured a sound, the next task is to edit and save it to disk. Your sample will be graphically displayed in the Sample Display Window which contains two moveable pointers. The area between these pointers is what is affected by most of the editing functions. You have the option of deleting a specific section, or setting it to zero (silence). You can also copy the section to a buffer and then paste

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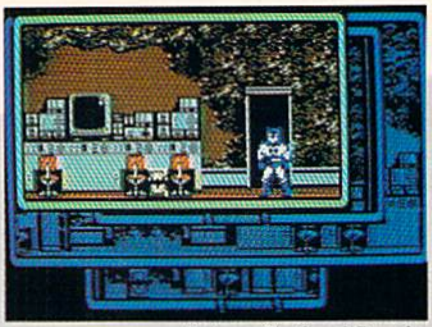
by Russ Ceccola

The Return of Batman

Our venerable software reviewer Russ Ceccola takes a brief look at some of the new entertainment releases for the Commodore 64 and Amiga.



Combat Course



Batman: The Caped Crusader

Well, here I am again with another edition of what will now be a regular column in *Commodore Magazine*. This month has been kind of slow for software—last month was a lot faster. Anyway, I've assembled here what I think are the best buys for August.

To clarify things a bit, I'd better explain again what I expect to do in this column. I hope to present my best picks of the month, with an occacional spotlight on arcade game conversions.

We'd really like to know what *you* think of these games as well. Once you've tried them, if you have any questions, comments or scathing criticisms, or if you just want to send me neat stuff or programs, write to: Russ Ceccola, c/o *Commodore Magazine*, 1200 Wilson Drive, West Chester, PA 19380.

Batman: The Caped Crusader ★★★★
Data East USA
470 Needles Drive
San Jose, CA 95112
(408) 286-7074
Commodore 64: $24.95

By the time this is printed, the movie will have been released and a resurrgence of "Batman-ia" may have taken the country by storm. A fan of the popular television series, I have always hoped for a game in which I could use the utility belt or batmobile to fight evil crimedoers in Gotham City. Now with *Batman: The Caped Crusader*, I can do just that.

You have to battle both the Penguin and the Joker in this great adaptation of the Batman tradition to the computer screen. First, you have to stop the Penguin's plot to take over the world with an army of robotic penguins by destroying his master computer in the umbrella factory. Then, you have to gather facts to find Robin, whom the Joker has just kidnapped.

Batman has all I could ever ask for in a computer game based on the famous caped crusader. The graphics are window-oriented, but easy to deal with. There are many objects that you can collect in *Batman*, from boomerangs to computer access cards. You can go through the bat cave and rev up the batmobile to chase after the villains. What's more, you don't need to drop a quarter in a slot to play *Batman*. Data East did a great job with the spirit of Batman and timed the game's release just right—an all-around success!

The Duel: Test Drive II ★★★★
Commodore 64: $29.95/Amiga: $44.95
The Supercars ★★★
Commodore 64: $14.95/Amiga: $19.95
California Challenge ★★★½
Commodore 64: $14.95/Amiga: $19.95
Accolade, Inc.
550 S. Winchester Blvd., Suite 200
San Jose, CA 95128
(408) 985-1700

I opened a huge package one day to find the above three programs inside. I rushed up two flights of stairs to my Amiga and sat there for a whole hour playing with them. *The Duel* pits you against the computer or a friend in a race down roads with the neatest scenery I've seen in a driving game since *Pole Position* came out in the arcades.

You can choose one of two cars: a Ferrari F40 or Porsche 959. Your opponent is able to choose the same car, so you can be equally matched. Despite what you may think, each car does perform differently at high speeds. It must be tough programming the cars' characteristics into the game, but believe me it works. You do actually have to drive the cars differently.

This brings me to the next thought. Why did Accolade put only two different cars on *The Duel*'s disk when the original had more? Because they want you to buy the car disk called *The Supercars*. I really think that they should have packaged a disk with the five cars on *The Supercars* along with *The Duel*. They could have raised the price a little and made the ultimate racing game package. By separating the cars out, they have allowed for expandability of the system, but at the expense of some customers.

California Challenge is a great game/scenery disk, and I'm happy that Accolade didn't just include a road with scenery on the disk as I thought it would be. They should have called it a "scenario disk." In any case, *The Duel* is an excellent follow-up, and the extra disks expand the life of the program.

Keith Van Eron's Pro Soccer
Commodore 64: $34.95 ★★★★
Medalist International
c/o MicroProse
180 Lakefront Drive
Hunt Valley, MD 21030
(301) 771-1151

There are so many soccer games available for computers that I was really biased against this game from the start. I thought to myself—oh no, not another soccer game! That was until I tried it and found it to be a good, solid sports game. The reason that I liked *Keith Van Eron's Pro Soccer* is the emphasis on the professional sport from which the game is taken. Other soccer games just put some players on a field and it's supposed to be fun—right? Wrong! They tend to be boring and uninspired.

Pro Soccer has good joystick response and fluid scrolling graphics to make the game exciting. I actually played a few more games after trying *Pro Soccer* once.

Getting back to the emphasis on professionalism, you'll find a lot of pluses in *Pro Soccer*. You can make different kinds of shots in the game—that's a first. Professional shots like a banana shot are unheard of in other soccer games. Also, you can play a World Cup Tournament in *Pro Soccer*. You can have up to 16 teams in a

tournament and play the games every step of the way.

Finally, the manual is very well written and has photos of Van Eron performing shots with some children, lots of diagrams and information on the history of the MISL. *Pro Soccer* is really good for learning soccer and playing it too!

Combat Course ★★★½
Mindscape, Inc.
3444 Dundee Road
Northbrook, IL 60062
(312) 480-7667
Commodore 64: $29.95/Amiga: $39.95

With the popularity of war/combat movies and military games in the arcades, I knew that the time would come when an original home computer game would cover the training of soldiers in what is essentially an obstacle course. Well, Mindscape tried their hand at such a game and did a really good job—especially since they included a construction set with the game.

Combat Course puts you right in the middle of basic training on an obstacle course designed to simulate the situations that can occur in a war. There are five challenging levels to the game and, after choosing a level, you must make it through as much of the course as possible before the timer runs out. After you clear an obstacle, you don't have to repeat it until you go through the course again. There are many types of obstacles that can be placed in your way, from poles and ladders to dogs, grenades and trenches. The joystick moves will become second nature—the only tricky thing that requires practice is climbing over walls.

The graphics are very colorful in *Combat Course*—almost cartoonish. However, you can easily tell the difference between obstacles. I like the joystick response of *Combat Course*—it was very easy to get used to the game play. To top off the package, there is a construction set on the disk that lets you design your own courses. It is easy to use and certainly extends the longevity of the game. *Combat Course* also uses a window interface that adds to the flavor of the game.

Hostage: Rescue Mission ★★★★
Mindscape, Inc.
Commodore 64: $29.95/Amiga: $49.95

With so much terrorism in this world, it was only a matter of time before a publisher released something based on a hostage scenario. Sure enough, in the same package as *Combat Course,* I received *Hostage: Rescue Mission,* a game that places you in the shoes of six Assault Force team members.

Hostage lets you take care of a complete rescue mission in four stages: setting up strategic locations across from an Embassy where hostages are being kept, gaining access to the Embassy by rappeling from the roof into windows, locating the hostages in the three floors of the Embassy and bringing the hostages out of the Embassy safe and, more importantly, alive.

I was in heaven with this game imagining myself as team leader of an elite antiterrorist force.

The sequences of the game are all radically different. This makes for better overall game play. I thought that Mindscape did their best in the graphics and sound department. You will feel as if you're actually descending upon the Embassy with your Assault Force. *Hostage* uses windows intelligently and keeps the scenes alive with excitement. You have to control the actions of all six men and you can make mistakes very easily. If you persevere, you will be able to save the hostages and make it to the congratulations screen. If that isn't enough, you also get your instruction manual in a dossier marked "TOP SECRET."

Software Reviews/ProSound Designer

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it in another part of the sample, either replacing that other part or inserting it before or after a designated point. You can even merge two portions of your sample (or a portion of the sample with that of another sample) so that both will be heard at once when you play the sample. Using this function, you can also create variable echo effects.

Aside from the buttons which appear on the screen, there is another hidden set of buttons which appears when the "Advanced Editing Function" button is clicked. These other functions include the ability to increase or decrease the volume and expand or shrink a sample (or any portion of it). The latter feature is useful when you capture a sound at a high sampling rate and want to reduce the memory required to store it. Finally, extraneous noise (such as background hum) can to some extent be removed using the "Add Value" function. To achieve accurate editing, *Pro Sound Designer* provides a magnification of the area between the pointers and even allows you to change a section of the sample by drawing it with the mouse.

But wait—there's more! *Pro Sound Designer* has an auto-record and playback mode that activates either the record or playback functions when the program senses an incoming sound at a user-designated level. You can also activate a filtering function which on an Amiga 500 or 2000 will improve the quality of samples recorded at higher sampling rates. Finally, you have the option of saving your sample as either a standard 8SVX IFF sample, or as a multi-octave IFF instrument which can be used in many available Amiga music programs. To save a sample as an instrument, you must first specify which portion is the Attack and which is the Decay, as well as the number of octaves you want the sample to cover. You can also retune the sample so it matches a specific frequency.

As if all of this weren't enough, Precision furnishes a second program on the disk—Pro Midi Plus. This program lets you load and manipulate up to ten IFF sound samples, and play them through the Amiga as if they were musical instruments using either the keyboard, a mouse or a synthesizer connected to your Amiga through a MIDI interface. Again, the main screen is a graphic control panel, replete with buttons, a Waveform Window and little piano keyboard at the top. Once you have loaded and selected the sound to play (and only one can be played at any time), you can raise or lower its pitch, set the duration of play, and change the attack and decay. You can even divide a synthesizer keyboard into four different parts and assign each part to a different sound.

All in all, *Pro Sound Designer* is a versatile sound digitizing system which produces clean, high-quality samples. The only real drawback is that users primarily interested in digitizing from a live source using a microphone cannot plug it directly into the hardware. While routing this source through a preamp may be a nuisance, it does, produce a higher-quality sample. The manual is neither long nor difficult to understand, and the disk is not copy protected (although a keyword protection system is used).

With short public domain sampled-sound player utilities available to play your sampled sounds, the uses for your own sounds are limited only by your ingenuity. *Pro Sound Designer* is a well-designed package providing more than the standard functions required for sampling, and they are presented in a manner easily comprehended. While there is nothing truly innovative about the system, *Pro Sound Designer* does the job and does it well.

by Howard Millman

People, Products and News

France's Computer Plan Ends in Failure

Early in 1985, France's Ministry of Education launched an ambitious $200 million program to install computers into every classroom and within reach of France's 12,000,000 students. Prime Minister Laurent Fabius considered this investment a step toward establishing France as a major competitor in the international computer market.

Theoretically, this seed money would enable France's electronic giant, Thomson CSF, to develop a computer under contract to the government. To encourage Thomson to commit its resources, the government guaranteed the company a captive and ready market—essentially a sanctioned monopoly. Bolstered by this initial sanction Thomson would first launch a PC revolution at home and then abroad, based on the French design. All in all the plan appeared foolproof.

But the computer industry follows its own rules. The grand plan is in shambles, Thomson's disbanded its personal computer division, and acrimony between politicians and industry leaders is rampant.

In retrospect the plan contained a major flaw. Politicians predicted the machine would be adopted nationwide once children used it in schools. They assumed parents would buy another for students to use at home. This broad consumer market would, in turn, put pressure on business to conform to the self-proclaimed French standard machine. Like a domino train, barriers to adopting the French-designed computers would topple before this inertia.

Unfortunately, the computer failed to win acceptance of consumers and businesses. Why? Because they were asked to support the fledgling design not for its technical excellence nor even for its price, but primarily because it was designed and built in France.

Consumers recognized the computer's flaws, politicians did not. The new Thomson computer, based on an aging standard, proved no match for the powerful machines produced by foreign manufacturers. By the time Thomson's machine reached the market, eight-bit machines were swept aside for 16-bit computers. "It was too little too late," remarked Ronald Bluden, a Thomson vice-president, adding bleakly, "We didn't have a fraction of one percent of market share in any other country."



Tales of Discovery is one of Scholastic's interactive fiction series, all of which stress reading and decision-making skills.

Since savvy consumers never caught the fever as politicians hoped they would, France's "Computers for Everyone" plan goes down in business annals as an expensive *faux pas* for both Thomson and the French Ministry of Education.

Support for the orphan machine in French schools continues to wane since the machine generated little software and even less of a future. The Ministry of Education, abandoning the French design altogether, recently purchased 9000 computers from foreign manufacturers.

C'est la guerre, at least in the world of computers.

Choosing the Best Educational Software

How do you intelligently choose one program from the mountain of educational software lining store shelves or listed in catalogs? How can you be sure you're buying a first-rate program that lives up to the shrink-wrapped package hype?

Ask someone who knows. In this case the someone is the Educational Products Information Exchange Institute (thankfully shortened to EPIE). Their newly revised "Parents Guide to Highly Rated Educational Software" lists 225 recommended programs for all computer systems including the Commodore 64 and 128. Divided into 15 subject areas, the Guide delivers a short description of each program, its list price as well as suggested age groups. Names, addresses and phone numbers of publishers are collected in an appendix.

A program's inclusion in the guide signifies its endorsement by EPIE. When we compared the guide's recommendations to our experiences, nearly all of the programs warranted a joint endorsement.

The guide costs $8.95, including shipping. Write to EPIE, Box 839, Water Mill, NY 11976 or call (516) 283-4922.

For a wider selection of educational software consider High/Scope Foundation's compendium the "Survey of Early Childhood Software." High/Scope's 1989 survey reviews 355 programs (124 of which are available for the Commodore 64 or 128), designed for children ages three to eight. The first crop of Amiga educational software is also listed.

High/Scope rates each program on a one to 100 scale and provides a summary of its strengths and shortcomings. Black and white screen shots accompany some reviews. Information about price, publisher and content is routinely included.

The 1989 survey costs $20. Contact High/Scope Press, 600 North River Street, Ypsilanti, MI 48198 or call (313) 485-2000.

Tales of Discovery

Computer:	Commodore 64
Publisher:	Scholastic, Inc. P.O. Box 7502 2931 E. McCarty Street Jefferson City, MO 65102 (800) 541-5513 (800) 392-2179 (in MO)
Ages:	6–10 years
Price:	$21.95 (home version) $29.95 (school edition, includes instructional aides)

Tales of Discovery describes itself as interactive fiction. In other words, as students read the adventure, they make decisions that influence the story's conclusion. For adults, interactive fiction is superb training for preparing income tax returns; for children it serves to reinforce decision-making and reading skills.

Tales of Discovery consists of a double-sided disk, one adventure per side. The first deals with pirates, side two recreates a trip back to prehistoric times. Both qualify as guaranteed attention grabbers

Continued on page 47

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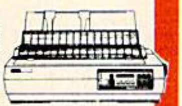
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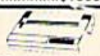
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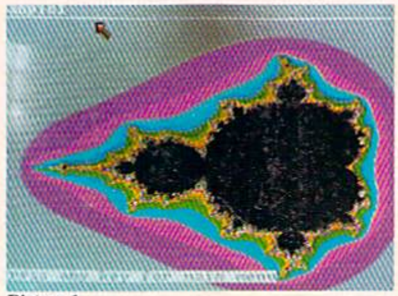
by John Iovine

Mandelbrot Graphics
for the Amiga

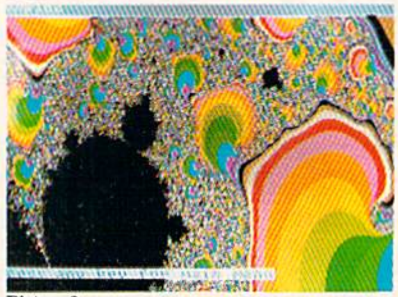
We have investigated Mandelbrot sets on the Commodore 64 and 128 computers. (See *Commodore Magazine* September and October 1988 issues, respectively.) The Amiga computer, as you know, has a faster BASIC, greater depth of color and higher resolution than Commodore's eight-bit machines. These attributes allow us to plot the Mandelbrot sets with improved definition.

Looking at the program, you will see we have not pushed the resolution to the maximum available; this is to keep processing time down. The screen we are working with is 320 × 200 with four bit planes. The four bit planes provide a 16-color palette.

The program will query you for a filename when started; this is for an automatic picture save function that initiates upon completion of the plot. The picture is saved as two 8K arrays. This is not in IFF format, but you can modify the program using the IFF Save program on the Extras disk (in the "BASIC Demos" subdirectory). After the plot is saved, you must load the picture per item two of the main menu to view the Mandelbrot set.



Picture 1



Picture 2

Time

The time required to plot Mandelbrot sets appears to be its biggest drawback. Many people don't want to wait days to see results. Writing the Mandelbrot program in machine language or compiled AmigaBASIC can greatly reduce the time required. Another possible avenue is to reduce your screen size to one quarter. This would reduce your plot time by about the same.

Picture 1 required about 90 minutes to plot. Picture 2 required 36 hours. Picture 2 is a magnified section of Picture 1. The CT value was increased from 100 to 550. The CT value limits the number of iterations the program will do for a particular coordinate (pixel). (See program.)

The Amiga provides the opportunity to produce professional-grade Mandelbrot sets. To produce professional graphics you will need to: (1) increase the resolution beyond the constraints of this program by using either a combination of interlaced screen and/or higher bit plane, and (2) commit your computer for days or weeks at a stretch to plot these resolutions.

If you plot these higher resolutions, your CT value must increase accordingly, as I have done for Picture 2. And most important you must allow for errors. It can be frustrating to plot a set for a couple of days to find there isn't anything there. One way to curtail these dead-end explorations is to plot the section at a low resolution before jumping to high res. If you stay on the border of the Mandelbrot set, I'm sure you'll always find something interesting.

Keep in mind that if it takes the computer a few days to plot these sets, the average person couldn't accomplish this with pencil and paper in his lifetime. This is the main reason chaotic equations—Mandelbrot and Julia sets—remained hidden until recently.

Amiga Mandelbrot

```
SCREEN 1, 320,200,4,1
WINDOW 2,"Mandelbrot Set",,16,1
FOR x = 0 TO 15
READ red,green,blue
PALETTE x,red,green,blue
NEXT
DIM array%(8403)
' Color informaton
DATA 1,1,1,.73,.73,.73,.8,0,.93,1,.13,.93
DATA 0,.93,.87,.4,.6,1,.47,.87,.1,.33,.87,0
DATA .73,1,0,1,1,.13,1,.73,0,1,.6,.67
DATA .93,.2,0,1,.87,.73,.8,.6,.53,0,0,0
WINDOW CLOSE 2


WINDOW 1,"Mandelbrot Graphics",,15,1
mainmenu:
LOCATE 8,10 :PRINT "Main menu"
LOCATE 10,10 :PRINT "1) Draw Mandelbrot Set"
LOCATE 12,10 :PRINT "2) Load Mandelbrot Picture"
LOCATE 14,10 :PRINT "3) View Mandelbrot Set"
LOCATE 16,10 :PRINT "4) Directory "
LOCATE 18,10 :PRINT "5) Quit "
LOCATE 20,10 :PRINT  "Enter choice 1 - 5"
getkey:
a$=INKEY$:IF a$ = "1" THEN mainroutine
IF a$ = "2" THEN loadpic
IF a$ = "3" THEN view
IF a$ = "4" THEN directory
IF a$ = "5" THEN END
GOTO getkey

END
mainroutine:
xl= -2.25#:xr= .75#:yt= -1.5#:yb= 1.5#
sm=10:ct=100
CLS
WINDOW 2,"Mandelbrot Set",,16,1
INPUT "Filename for picture save";f$
INPUT "Enter XR ";xr
INPUT "Enter XL ";xl
INPUT "Enter YT ";yt
INPUT "Enter YB ";yb
INPUT "Enter # of Iterations";ct
CLS
dx = (xr-xl) : dy = (yt-yb)
FOR x0 = xl TO xr STEP dx/319
```

```
FOR y = yb TO yt STEP dy/199
a = x0*x0-y*y+x0
b = 2*x0*y+y:c=0
iteration:
r = a*a - b*b+x0
i = 2*a*b +y:c = c+1
a=r:b=i
ji = (r*r+i*i)
IF ji < -10 THEN Draw
IF ji < sm AND c < ct THEN  iteration
Draw:
x1 = INT((x0-xl)/((dx)/319))
y1 = INT((y-yb)/((dy)/199))
IF c = ct THEN c = 15
getcolor:
IF c => 16 THEN c = c - 15: GOTO getcolor
PSET (x1,y1),c
NEXT y,x0

savepic:
x1=0:y1=0:x2=319:y2=99
GOSUB getarray
y1=100:y2=199:f$=f$ + ".1"
GOSUB getarray
WINDOW CLOSE 2:GOTO mainmenu
getarray:
GET (x1,y1)-(x2,y2),array%
OPEN f$ FOR OUTPUT AS 1
FOR x = 0 TO 8403
PRINT#1,MKI$(array%(x));
NEXT x
CLOSE 1
RETURN

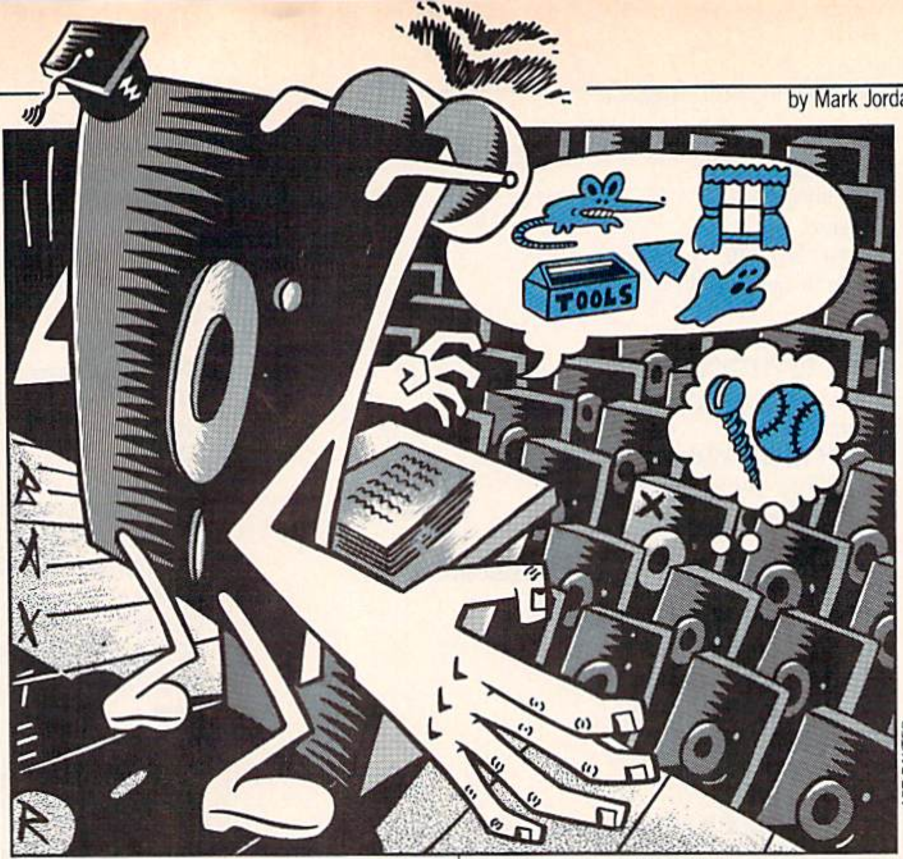
loadpic:
CLS
INPUT "enter files name"; f$
WINDOW 2,f$,,16,1
CLS
x1=0:y1=0
GOSUB putarray
y1=100:f$=f$ + ".1"
GOSUB putarray
GOTO view
putarray:
OPEN f$ FOR INPUT AS 1
FOR x = 0 TO 8403
array%(x)=CVI(INPUT$(2,1))
NEXT x
CLOSE 1
PUT (x1,y1),array%
RETURN
view:
WINDOW 2
repeat:
LOCATE 22,1:PRINT "Press any key for main menu"
a$ = INKEY$
IF a$ = "" THEN repeat
WINDOW 1 :CLS:GOTO mainmenu
directory:
CLS
FILES
GOTO repeat
```

END

by Mark Jordan

geoJargon

Berkeley Softworks' series of GEOS-compatible products opens up a world of opportunity to Commodore users. Take some tips from Mark Jordan and soon you too will be Pumping GEOS.



ART BAXTER

How would you respond to this statement: "The taxonomic value of the facilitator's utilization of synthesis within the cognitive domain is inversely proportionate to the incorporation of structured spontaneous endeavors beyond the scope of the call-recall arena"? I'm sure you responded like I did when I tried coming up with that sentence: you felt pain. Brain pain. There's nothing like a good dose of jargon to make you vow never to use a poly-syllable word again.

Don't make that vow. Jargon, for all its misuse, is necessary. And just what is *jargon?* It's a form of shorthand specific to a given field. It's technical words. It's words that only those on the inside seem to know. And—though it can be grossly misused in order to intimidate outsiders—we've got to have it. How inconvenient it would be if, each time we wanted to refer to the function keys on our computer keyboard, we had to say, "Those keys with the F followed by a number."

GEOS has its own set of trade words. One could, if one wanted, simply grab a GEOS manual and look up unknown terms in the glossary. Not a bad approach. But glossaries, like dictionaries, have an achilles heel: they're formal. Any person who learns and then tries to use words simply based on a dictionary definition may get strange looks.

Language is never easy to get a hold of. To really understand a term you need paragraphs, not sentences; you need shades of meaning, half-tones, opinions. Opinions I've got. And guess what? They're here, they're now, and they begin in the next paragraph. An armchair glossary of sorts, to help users new and old with GEOS jargon new and old.

Group 1: Wimp Words

1) **Icon:** With a graphics operating system, this is the key term to know. The word itself has been around for a long time, but it wasn't until the computer industry started calling little pictures on the screen "icons" that I learned what it meant. The word comes from the Latin "i-con" (not much anglicizing involved here) meaning "likeness" or "image."

This little word is part of a newly-coined acronym, *WIMP,* from "window, icon, mouse, pointer." Undoubtedly, pseudo-macho power-users came up with *WIMP* to show their disdain for graphics operating systems, but to paraphrase a biblical passage, "Blessed are the wimps, for they shall inherit the earth."

2) **Window, Mouse, Pointer:** While I'm on the subject I might as well cover the other three terms involved in *WIMP.* Since these are such basic GEOS concepts, I'll only say this: the plural of *mouse* is *mouses.* The votes from the survey I began several months ago to determine if *mouses* or *mice* is the preferred plural, have been laboriously tabulated and the tally is dead-even (2–2). Thus, I am breaking the tie: mouses wins. [***Editor's Note:*** *Apologies to Ms. Lillian Larre of Clio, CA whom I assured had the final say with her defense of (my choice)* mice *in the May Letters column.*]

Group 2: Some Macho Terms

3) **Application:** This term is used more by the GEOS manual than by users, which makes it especially important to understand if you want to understand the manual. An application is simply a GEOS program such as *geoWrite, geoPaint* and so forth. Why the word *application* instead of just *program?* Well, for one thing, it's a particular type of program—thus it's more precise. For another, it's a program that "applies" the GEOS concept to do something practical. Applications are distinct from a desk accessories, so we better look at that next.

4) **Desk Accessory:** This is also a program running under GEOS but it is a sub-program . . . that is, it runs from within an application. The calculator and notepad are available from within all GEOS applications; thus, they are desk accessories. Desk accessories are in the form of overlay windows which, once finished, should return the screen back to its pre-accessorized state. I say "should" because I've used a few accessories that hackers have devised which somehow fail to do that.

5) **Dialog Box:** This term, a good one to know, is seldom used by the occasional GEOS user. A dialog box is just an overlay window that pops up from time to time to ask the user a question or two. The word undoubtedly is meant to imply some sort of conversation between the user and the machine. It's a very limited conversation because all the computer does is ask a question and all you say is Click.

I have a suggestion for program developers concerning dialog boxes: allow a keyboard alternative, especially to clicking Yes. A press of the Y key would be a nice alternative for touch-typists. And one more thing: good dialog boxes always allow the user a Cancel option just in case he didn't want to be there in the first place.

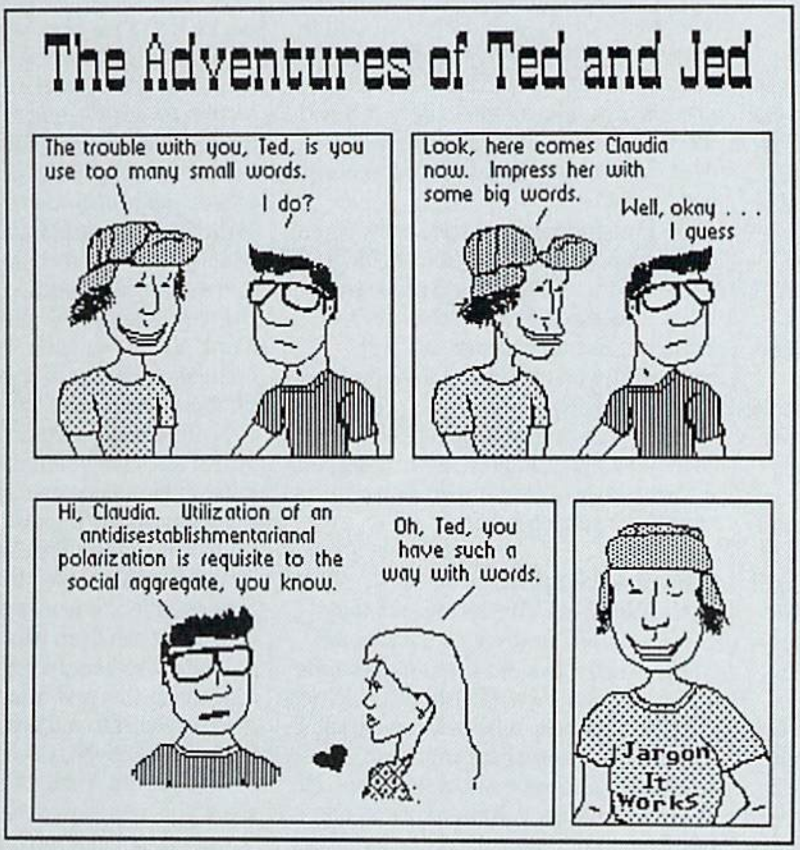
Continued on page 36

Smilers and Smackers

Jargon is necessary. New words must continue to make their grand entrance into any area of specialization. Computers are no exception. What follows is a list of terms I believe needs to be added to the Commodore domain.

Checkbook Zealot: A user who actually uses his computer to balance his checkbook. Rare.

Datasettler: User who still uses cassettes for storage and danged if he's going to upgrade to a disk drive.



Delusions of RAMdeur: The belief that there is a certain amount of RAM that will finally be enough.

Inferiority RAMplex: Psychological condition in which person feels shame because he has less RAM than everybody else.

Jargonaut: Person who uses computer jargon to impose authority.

Nerd-herd: Group of highly technical computer geeks sitting around discussing cpu's. True jargonauts. Impressive in herd but not when alone.

Paper Pirate: A software thief who will go so far as to photocopy the manual. Chief behavioral signal: often stays late at the office without boss prompting.

Pitswap: The time it takes to swap disks. One of the driving forces behind increased sales of disk drives.

RAMpage: Wild, emotional state that occurs upon discovery of RAM disk's contents being lost.

Smiler: Amateurish program which rewards correct responses with a smiley face. Highly annoying.

Smacker: Computer user who deliberately makes wrong choices so he can watch sprites smack into buildings, blow up, etc.

Yes'm: A software review with nothing but praise. A favorite of software publishers.

More Grassroots GEOS Products

Utilities, desktop accesories, fonts, laser fonts . . . all kinds of exciting things are happening in the GEOS community these days. Below are listed a couple handy GEOS programs to help you with your geoPaint files, icons, and albums.

Paintview, by Joe Buckley. Allows you to view Paint documents outside of geoPaint. Also allows you to switch drives from within the program, a great relief to two-drive (or REU) users. Use the mouse to scroll around an entire Paint file. Write to Mr. Buckley at Storm Systems, 464 Beale St., W. Quincy MA 02169.

GeoView, by Steve Bassler. Pretty much does the same as the above with one drawback and one enhancement. The drawback is that it doesn't allow for drive switching. The enhancement is that it allows you to print any screen you display. Write to Mr. Bassler at 109 1/2 Ruby St., Derry PA 15627.

ScraPeek, by Ed Flinn. This one lets you view photo scraps in albums or on disk. Similar to the two above in operation. Available on Quantum Link. (Sorry, I don't have the address).

Icon Grabber, by John Paul Young. This is the most attractively done utility I've seen in the GEOS sphere (which, incidentally is the name of a magazine Mr. Young intends to produce with one David A. Reyes -- **geoSphere!** If the magazine is as well done as Icon Grabber, it should be excellent.) This desk accessory has that all-important feature of drive-switching. What's it do? It lets you copy file icons to and from photo scraps and Paint files. Very powerful. Get it from Mr. Young at 1202 Silverway, San Antonio TX 78251

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Continued from page 34

6) **Clicking and Double-clicking:** Don't moan—there is more to these two terms than meets the ear. *Clicking* means to click the mouse (or other input device) button once. *Double-clicking* means twice and in rapid succession. How does the computer know if it's a double-click or two single clicks? The timing is preset within GEOS.

You can run into trouble with the timing factor when you want to move icons around for whatever reason. To do so, GEOS demands you click once to highlight an icon (file), then click again to create a ghost icon (see below) which you can drag wherever you want. This means you need two single clicks—not a double-click. If you click too fast, GEOS interprets it as a double, and you'll find you've either opened up an application or initiated some other happenstance which you didn't want. I hope version 3.0 (or whatever's next) allows us users to adjust the timing between clicks

7) **Version ###:** While I'm on the topic, some readers might not understand where the software companies come up with their version numbers. Is there a law or something that says they must start numbering with 1.0 and then go to 1.1 and so on? The answer is no, there tain't no such law. Version numbers are incremented however the software manufacturer decides to do it. Which leads one to speculate, why not ship a new product with a higher number than 1? Like, why not version 4.0, or better yet, version 4.7? That makes it sound like you've got a product that's been around awhile, that's evolved, and one that is a mature piece of software.

Group 3: Scary Terms

8) **Ghost Icon:** This is the outline of an icon that occurs when you click it once. Its purpose is to let you know that you have indeed clicked it. I have some suggestions for future scary terms. How about *Ghoul Icon* for one that has been corrupted? Or *Gremlin Icons* for icons that have been selected (highlighted) but are on other pages and not presently visible?

Group 4: Boring Terms

9) **Command Menu:** This is that famous line at the top of the screen that drops menus down from it.

10) **Data File:** There are many different types of files; in fact, the word *file* itself confuses many newcomers. The idea behind using the word *file* is that a computer file is similar to a file cabinet file; that is, it is a folder filled with information. Since GEOS shows everything as an icon on the screen, it confuses some users why they can't just double-click any icon and start things up. The reason is that a data file isn't a program; it's just a file of data.

Group 5: Terms Beginning with the Letter F

11) **Font:** Every GEOS user knows what this word means, right? Right. But I put it in here anyway because there just might be someone out there reading this who isn't a GEOS user. Here's the definition: a text typestyle. If you use *Fontmaker,* you can create your own and even give them your own name. Record it with the U.S. Patent Office, and you might even make money licensing your font. But don't count on it.

12) **Fine-tuning:** This term shows up in the *geoPublish* glossary but it should be in all GEOS manuals—it's a crucial concept. What it means is to move the cursor or pointer in one-unit increments. The mouse relies on gross hand movements. The cursor keys require taps . . . just the thing for fine-tuning. GEOS 2.0 allows cursor key fine-tuning in most modes, but it wasn't always so. It's another reason to upgrade to version 2.0.

Group 7: Graphics Terms

13) **Attributes:** This term is a handy one; I use it all the time. Attributes are traits, usually graphic, that an object on the screen may have. These traits include the type of pattern used to form a graphic, whether it's transparent or opaque, whether it should be smoothed or not, etc.

14) **Smoothing:** A somewhat recent GEOS concept, this term came into play when programmers decided to help us users overcome the jaggies. As any geoPhyte knows, lines that are not perfectly horizontal or vertical often have a stairstep effect commonly called "the jaggies" that can be annoying, especially if enlarged. Since GEOS 2.0 allows you to stretch graphics, you also will stretch your jaggies.

Smoothing attempts to overcome this by having the computer analyze the lines on the screen in order to smooth out those jags. My opinion of the process is that it's pretty worthless. It never seems to smooth them the way I want. I've found a better way—do it myself. I use the pixel edit mode and do it right, especially when working with enlarged text. It may be slower, but the human brain sure knows more about smoothing than GEOS does.

15) **Pixel Edit Mode:** More commonly referred to as "Zoom Mode," this mode of using GEOS is the one that allows you to see the dots you're working on up close. Almost every GEOS artist I know works heavily in the pixel edit mode, and by heavily I mean more than 70% of the time. It's the only way to go for creating detailed drawings. My only gripe is one I've made in this column before: the either/or draw mode. Much easier to do is the hold-and-draw method where drawing occurs only if button is held down.

16) **Transparent/Opaque:** In the old days (GEOS 1.0 days) only opaque existed. *Opaque* means that when you grab and move a section of screen, the moved section covers whatever is beneath it completely, even in the spaces where the moved object has unlit pixels. *Transparent* allows you to only move the lit pixels. With the transparent attribute selected, when you grab a section of screen and move it to a new location, whatever lies in the new location will show through any blank places—in other words, you are building up layers of drawings. Another reason to upgrade to 2.0.

17) **Import/Export:** Since GEOS is integrated software, there has to be a way to take info from one application to another. There is, via the Photo Manager (for graphics) and the Text Manager (for text). The process of moving things back and forth is called "importing" or "exporting" depending on which way you're going with the data. I've heard a lot of people crabbing about this and that with GEOS, but when it comes to integration, the crabbing better cease. Nobody does it better.

18) **Bitmap:** Another ancient term to most, this is one of the staple terms of all the graphics-environment computers (Amiga, Macintosh, etc.) A bitmap is a map (kind of) telling which pixels (bits) are on and which are off. For example, if you use the copy tool in *geoPaint* to move an area of the drawing window, when you mark off the region to copy, the computer treats the enclosed space as a bitmap. In black and white mode, this map is simply a grid of pixels on/off. But mix color in, and the computer has more work. At any rate, users only need to think of a bitmap as a graphics object that they can move around.

Don't think bitmapping only applies to graphics. By using the Paint Drivers anything you produce on any GEOS application can be converted into a *Paint* document which you can then use to create bitmaps with. One application of this trick is when doing laser printing: the laser driver

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by Shay Addams

Robots, Rockets and Renegade Priests

News and opinion from a leading explorer of those fantasy realms called adventure games.



MIA BOSNA

To celebrate the U.S. space program's recent revival, I'm devoting most of this column to science fiction adventures (hopefully, no shuttles will have blown up between now and the time you read this!). One new game will surprise many adventurers—a role-playing game from Infocom. Recently picked as Best Quest of the Month by QuestBusters, *BattleTech: The Crescent Hawk's Inception* is a role-playing game based on a popular paper and pencil RPG from FASA, who also markets a non-computer RPG about *Star Trek*. Available for the Amiga and Commodore 64, it was programmed by Westwood Associates, the Vegas team that did *Mars Saga, Questron II* and a number of refined conversions.

BattleTech takes place in the 31st Century, after the Star League has fallen apart and been replaced by an assortment of "combines" reminiscent of the feudalistic families in Frank Herbert's novel, *Dune*. While most of this distant civilization's technology and science has withered away, one major by-product has endured—a mining robot refitted as a walking, flying, fighting machine. Called "BattleMechs," they're the weapon of choice of the five "combines" that are continually waging war amongst themselves. A BattleMech's weapons and armor varies widely, depending on which of the 55 models you're "driving" at the moment.

Your role is that of Jason Youngblood, whose long-range goal is to find his father. But you'll pick up clues that eventually lead you on another search that's tied into your main goal. Don't worry about having to fast talk clues out of this world's inhabitants the way you did in the last couple of *Ultimas*, for you don't have to say a word to anyone; choose the option "talk to character," and the person recites whatever he or she has to say (if anything). The *BattleTech* experience consists mainly of searching for clues and fighting enemy BattleMechs—there are practically no serious puzzles (other than staying alive) until you reach the tricky end game.

Up to four non-player characters can join your group, but watch it—some might turn out to be spies. Another crew member, however, proves vital to completing the end game. The crew attends Pacifica Training Academy to improve their Bow/Blade, Pistol, Technician and four other skills. But you won't be able to boost everyone's rating to the maximum in every skill; this can be done only for skills tied into a character's profession—a realistic yet uncommon design element. In Pacifica you also get a chance to earn money in the local stock market and wrap up your Mech training. After you've completed several training missions, an enemy attack obliterates Pacifica, forcing you to fend for yourself on the open land. Unless you're lucky, this means on foot and without a BattleMech, which must then be rounded up later on.

Combat is animated and viewed from overhead. Graphically the game excels here: various colored lasers and missiles split the skies, and Jason's and the Mech's movements are intricately detailed. Sound effects are also well orchestrated (you hear a different sound for each weapon). If your Mech has jump jets, you can select the direction and number of steps to move, then watch as your Mech snappily executes the command. Occasionally you'll witness cartoonish, animated visions of your character's expression, shown from a first-person perspective.

You can let the computer control combat for you, which is done more intelligently than in some RPGs such as *Pool of Radiance*, for example, in which the computer will waste lots of spells. Another useful feature is auto-mapping, composed of an aerial-view map that starts out black and is filled in as you explore; this can be viewed at any time.

Mastering the combat system and interface will be your biggest challenge in *BattleTech*, so I recommend this strongly for science fiction fans, especially those who want to do something besides flying space ships and blasting the enemy's ships. (You can save up to six games in progress, five more than most RPGs allow, and the program is not copy-protected.) Look for a string of sequels, for *BattleTech* could easily become Infocom's next major series.

Star Saga: Reading Your Way to the Stars

Here's an odd one. Designed by Andrew Greenberg, one of the creators of Sir-Tech's *Wizardry* series, *Star Saga: One* combines the depth of paper and pencil role-playing with the power of the computer. Up to six people can play. A solo game is possible, but it won't be as entertaining as playing with friends who assume the role of characters in the story. You might choose to be a rocket pilot, a renegade priest or a risk-taking smuggler, for example. Each character has a different goal, lending the game a distinctive tone, and the first person to complete his goal wins. But that's not all that sets *Star Saga: One* apart from other RPGs—for you'll spend more time looking things up in the set of manuals (one for each character) than you will looking at the screen.

After reaching a new planet, for instance, you can choose from several options, such as talking to people or exploring. Your choice leads you to look up a specific chunk of text in the appropriate manual, somewhat like the "Paragraphs"

booklet that accompanied *Wasteland.* The six manuals add up to almost 900 pages of text, so this is not a game for the visually oriented.

If you can round up a few friends who'll meet regularly for sessions, consider checking this one out. Then again, this hybrid game system eliminates one key advantage of conventional computer role-playing games: because most computer RPGs are meant to be played by one person, you don't have to figure out what to do when Duffy doesn't show up for the weekly session. *Star Saga* might also be worth a look if you're already interested in paper and pencil RPGs. MasterPlay is marketing this one for the Commodore 64 and Amiga—at a steep $79 price tag. Two sequels are planned (can anyone guess their names?).

Space Quest III: Roger Wilco and Far Out

So far I've only seen a pre-release version of the next chapter in Sierra's wacky science fiction series, which was shown to me by those Two Guys from Andromeda themselves, Mark Crowe and Scott Murphy. Those Two Guys wrote themselves into the story this time. In *Space Quest III: The Pirates of Pestulon* (a take-off on *Pirates of Penzance),* they've been kidnapped by the pirates and put to work at ScumSoft, an intergalactic software company that makes the dynamic duo design dismally dumb arcade games. As Roger Wilco, your goal is to find and rescue them.

Part of this task involves flying a space ship to assorted planets. Unlike in the first two games, however, this time you have much more control over the ship and even get to decide where it goes. You'll see more of the full-screen, first-person graphics introduced in *Space Quest II.* And the puzzles and story flow are less linear this time, so you don't always have to complete a certain puzzle before moving to a new area. As Murphy explained it, "You can go just about anywhere you want, when you want." That should make it less frustrating than their previous games. The Amiga *Space Quest III* should be out by now (or very soon)—it's a definite yes for puzzle-and joke-starved adventurers. (No 64 version is planned.)

Other New Quests and Conversions

Dungeon Master is clearly a high point in the realm of Amiga role-playing. Its interface incorporates the mouse most dramatically: instead of punching a key to "eat food," you slide an icon representing the morsel across the screen and into a person's mouth! It's a monsters and mazes scenario featuring stereo digital sound and some of the most impressively detailed dungeons I've yet to get lost and killed in. You'll have to bump your RAM up to a megabyte, but this game alone is worth the cost.

It won't happen soon, but we may see the first Amiga *Wizardry.* Sir-Tech's *Wizardry V: Heart of the Maelstrom,* which will be out for the Commodore 64 later this year, is reportedly "on the drawing board" for the Amiga. (And don't even ask when the Commodore 64 *Ultima VI* will be ready, though Lord British is already up to his neck in orcs on it.)

Clues of the Month

BattleTech: To make money, put most of your funds in NasDiv and a few in BakPhar. Invest in BakPhar when its value starts rising, saving the game at this stage. Keep an eye on its price and sell when it starts falling, since it can drop rapidly: frequent game saves are the key. Save up your money for an Inferno, which never runs out of ammunition and is very accurate. You may be able to escape the invasion of Pacifica with a Mech. Try using a Chameleon on the mission and running north at top speed when the attack commences. After the buildings are destroyed, run and jump to the west side of the city and escape through the hole in the wall. A Mech and a crew member are found in the jail (in a village northeast of Star Port).

Neuromancer: When fighting an AI, use Psychoanalysis to determine its weakness, then apply that skill and follow up with all four attack skills. Use Zen to recover from mental damage. Enter *all* Bases from Cyberspace, because entering a Base Cyberspace is different from using the link code. Since ArmorAll 1, 2 and so on are different programs, keep the two highest levels to restore your deck's armor while ICE-breaking. But hold onto just the highest number of each attack program. Probe will tell you what you're fighting; then exit, re-enter and use ICE-breaking skill, Slow, a Virus, then the attack programs. High-level Jammies will stop the revolving ICE for one attack (and you can reuse it). For an account with $50,000, defeat Gold after entering Bank Berne from Cyberspace.

(These tips were provided by QuestBusters James Simpson, Frank Chin and Dagan Galarneau.) ■

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doesn't treat fill patterns properly. You can overcome the problem by converting sections of the screen into bitmaps.

19) **Pixel:** A blend of *picture* and *element,* this word refers to the lit or unlit dots on your screen. Don't be confused and think that any blob on the screen is a single pixel just so long as it's a blob. A period, for instance, has four lit pixels in regular Commodore BASIC. An 80-column screen has 640 pixels in each row. The 40-column screen has half that many—320. Both allow for 200 rows of pixels. Each pixel corresponds to a single bit somewhere inside your computer's memory. And with GEOS, each one represents a single dot on your dot matrix printer. That's what makes GEOS the most WYSIWYG (see below) software of all.

20) **Toolbox:** This word denotes a group of icons within an application that you can click and use. In *geoPaint* it is the 16 icons on the left of the screen which allow you to choose between drawing, lines, Undo, etc. In *geoPublish* it's the moveable box of icons available in Master Page and Page Graphics mode. My only peeve about the toolbox is in *geoPaint* it sometimes disappears after I do something, and I have to go click the wrench icon at the top to get it back—a waste of time.

21) **WYSIWYG:** This is an acronym formed from the following: What you see is what you get. It means that your paper printout should match the screen it came from. There are three levels of WYSIWYG-ness. Level 1 is simply when the screen shows you the lines of text with correct margins, formatting, and maybe bold and underlining. Level 2 is when each dot on the screen becomes a dot on the printer. Level 3 is the same as level 2 except that the screen dots are virtually the same size as the printer dots. Only the Macintosh, with its unusual screen resolution, does that. But GEOS, in the 40-column mode, comes close.

Group 8: Other Terms with No Room Left to Discuss

22) Shadowed Disk Drive

23) Scrap

24) Printer Drivers

25) A whole bunch of *geoPublish* terms

26) And more.

I could add lots more terms to this list and maybe in the future I'll do a sequel such as "Son of geoJargon" or "geoJargon—Part II: The Wrath of Icon." Check out the Pumping GEOS document if you really want to see some jargon at work. ■

by Robert W. Baker

Music Connection

Explore the inner workings of the Q-Link telecommunications service with network pro Bob Baker.



LINDA CLARK

People Connection will never be the same! Q-Link is adding a new Music Connection service to People Connection. Now you'll be able to play music and sound files from the Commodore Information Network (CIN) SID music libraries anywhere in People Connection. Plus watch out for "Mr Music" who has an extensive range of very special music rights. It should be really exciting to have the world's largest SID Music library, containing more than 5000 SID music files, at your disposal.

With Music Connection you'll be able to receive music and sound in three basic ways:

You'll be able to browse a Directory of Music that lists SID files. Then simply type the filename into a Play Music field, and you can hear the music or sound while you're in People Connection. You can even chat with other users and play music at the same time. The Music Directory will contain an assortment of categories, including Pop/Rock, Classical, Country, Holiday Tunes, Movie Themes and more.

You might also receive music or sound sent from Mr Music, who will be roaming throughout People Connection from time to time. Mr Music can open a room and set a theme song that anyone entering the room will automatically hear. Imagine a theme song in Bonnie's Bar or other favorite gathering spots. Plus, Mr Music will also be able to spontaneously assign some of his special rights to other members.

You'll also find a Top Tunes menu in Music Connection that will feature favorites from the CIN libraries. Simply select the menu options and the music will play. This is supposed to be an "album" feature, if you will.

In addition to the new music functionality, the original People Connection functions remain, but now with exciting enhancements. For instance, the Auditorium will have all of these capabilities, greatly enhancing productions including game shows, online theater and conferences. Now there'll be sound effects, theme music and more.

Watch for new special music events that will be introduced in the coming months, including special music trivia and music-oriented game shows. The Sysops of the Music Studio in CIN will also be holding their conferences in Music Connection, greatly enhancing the utility of online music conferences. Imagine learning by seeing the results of your work and having it critiqued online by your peers.

Besides all the new features, Music Connection menus will be dynamic. You'll be able to open and close menus within the chat environment, plus toggle between menu and chat mode. There will also be options to play the same song again, stop a current song and even disable or enable music if you like. With the Music Connection disk you'll find a whole new look to People Connection. Get your copy of the new Q-Link disk from the Q-Link Store in the Mall, or download the update online when it's available.

From the rumors I've been hearing, this is only the beginning of a whole new set of features and services to be added to Q-Link in the coming months. Many of the changes and enhancements you've requested in the past have not gone unnoticed. I'll be covering each new update as it's released, but watch for online announcements for the latest information. With the magazine lead times, many of the new services will probably be available online before I can talk about them in this column.

Introduction to PC-Link

As you may have noticed in previous columns, I've been active on PC-Link, Quantum Computer Services' online service for MS-DOS users. I'm sure everyone is aware of Commodore's line of MS-DOS-compatible systems, including the COLT for home and home office use and the Professional Series III business line. In the coming months, *Commodore Magazine* will be expanding their coverage to include information on the MS-DOS market. In conjunction with that expansion, I've been asked to give an introduction to the PC-Link service.

Basically, PC-Link is very similar to Q-Link. It uses proprietary software provided by Quantum that you must install and run on your system to access PC-Link. The software uses the Tandy DeskMate package that allows keyboard or mouse controls with pull-down menus, requestor boxes and other convenient user interfaces. Overall, you'll find the software very easy to learn and use.

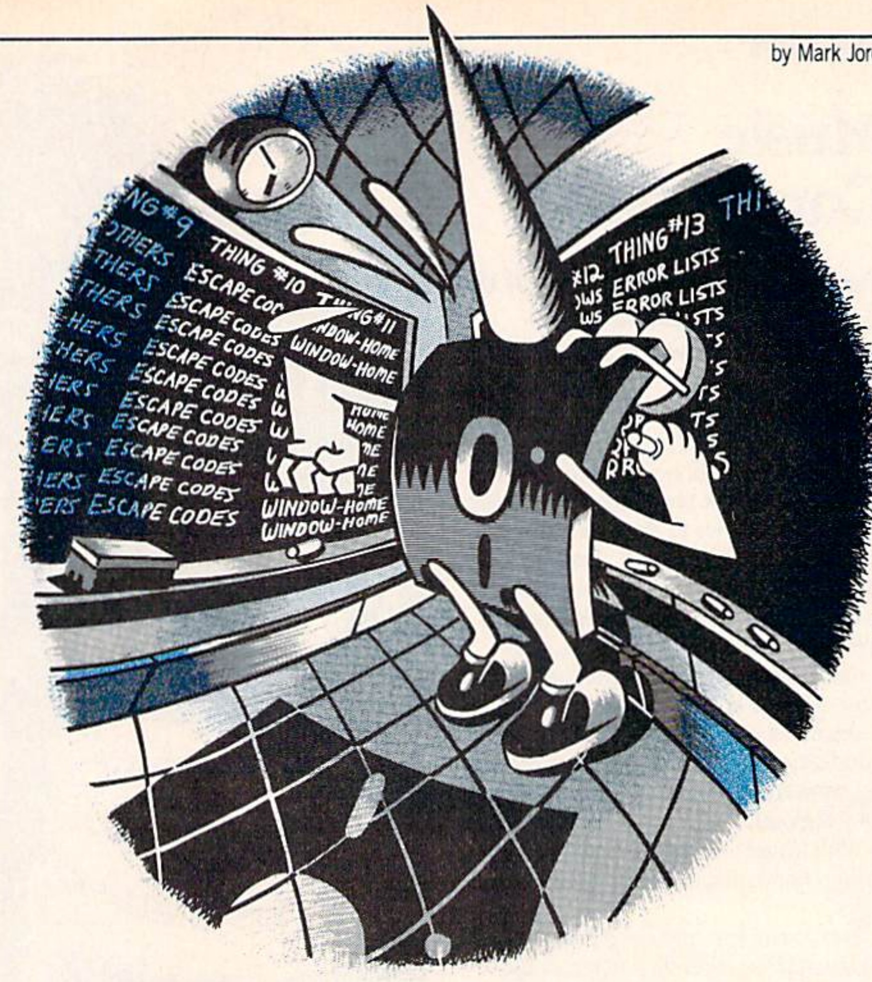
The PC-Link software requires at least 384K of available memory, MS-DOS version 2.11 or higher, and a Hayes-compatible modem. The start-up software package is $29.95 and includes one free month of service plus two free hours of PC-Link Plus services. The monthly usage fee is $9.95, with no extra charges for higher baud rates. Plus charges are $0.10 per minute during evening and weekend usage. The start-up package is available at your local Tandy center, or you can call Quantum at (800) 545-6572.

When you log on to PC-Link the service is logically split in half, with the standard services clustered in one section and the plus services gathered in another section. This makes it a little easier to watch your plus time charges, but it may be a little confusing where some services may offer features in both areas. You can easily move from one area to another by press-

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by Mark Jordan

Things Everybody Knows About the 128



ART BAXTER

In a few months we'll return to exploring the 128's native mode through programming. But before we dive back in, let's review some of the basic moves everybody *should* know about BASIC 7.0 and the Commodore 128.

One of the very first articles I ever read in any computer magazine was by Commodore guru Jim Butterfield entitled something like, "Everybody Knows That . . . " The article listed numerous nuances of the then-new Commodore 64. They were the kinds of things that are hard to find in the user's guide, the small but mighty things—the subtle body language of the 64. For me, a novice 64 user, the article was very illuminating. The one item I remember that really helped me at the time was the [SHIFT RETURN] maneuver.

The Commodore 128 isn't new, but it does indeed have a subtle and complex body language all its own, one that new users and even old pros are ever-learning. Some of its gestures are as slight as an eyebrow twitch; others, like the flashing eye of a disk error, are more obvious. I've had four years now to learn Madam 128's nods and winks and (with apologies to Mr. Butterfield) I'd like to share my discoveries. These aren't tips exactly, nor are they tricks. They're simply Things Everybody Knows About the 128.

Thing #1: The [SHIFT RETURN]: Okay, I'm stealing from Jim's list. And I already mentioned it. But this is one of those little goodies that you don't find readily in manuals. Think of the [SHIFT RETURN] as a way to escape from any program line your cursor is on. Whenever you get in trouble, [SHIFT RETURN] your way out of it.

Thing #2: The [SHIFT space]: Also common knowledge is the fact that holding SHIFT down while pressing the space bar sends a different character code to the computer. A regular space sends CHR$(32) to the operating system. But with SHIFT pressed it sends CHR$(160). Of course, both look the same on the screen—they're both blank spaces. But if a programmer would include an input loop which was looking for spaces and the user accidentally pressed the SHIFT at the same time, the program might not respond properly.

Thing #3: Saving Function Key Definitions: Everybody knows that the function keys on the 128 are implemented by the operating system. And everybody knows that you can redefine them just by typing KEY [1–8],"[definition]". Like this:

KEY 1,"DIRECTORY" + CHR$(13)

And surely everybody knows that you can even include quotes within the definition by using the CHR$(34) statement. Like this:

KEY 1,"PRINT" + CHR$(34) + "HELLO" + CHR$(34) + CHR$(13)

In fact, everybody knows how to program function keys so well that it's probably a waste of space to tell you how to save a whole set of eight . . .

BSAVE "KEYS",B0, P4096 TO P4352

. . . and how to load them back.

BLOAD "KEYS"

So I won't explain it. (Nor will I mention you can save multiple sets of these, each tailored to different needs.)

Thing #4: The Bell: Another bit of common knowledge is the fact that the bell can be programmed with a PRINT statement: PRINT CHR$(7), or, more simply, it can be typed: PRINT "[CTRL G]" so one doesn't have to type out all those horrible letters and parentheses in CHR$( ).

Thing #5: Programming the Mouse from BASIC: Since so many of 128'ers own mouses, and since the POT function is so well documented, it follows that most 128'ers have picked up on the little quirk of the OS that requires you to strip off the seventh bit to get a useful rendering. Like this:

X = POT(1) AND 127
Y = POT(2) AND 127

Of course, by doing it this way, it's plain to see that we can now only read values from 0 to 127 on our mouse before they

turn back over to 0, but we all know this and have learned to work with this trait.

Thing #6: The MID$ Twist: Though the original user's guide didn't note MID$'s fancy ability to insert characters in a string, users quickly discovered this trait. The latest manual shows how (on page 321). The way it works is, if you have a string such as A$ defined—like this: A$="EVERYBODY KNOWS"—and you want to change it to "EVERYBODY SHOWS" all you'd need to do is this:

MID$(A$,11,2)="SH"

BASIC 7.0 will then count to A$'s eleventh character (which is the K in KNOWS) and then put two characters (the SH) in the eleventh and twelfth slots. A great device . . . and one that everybody knows.

Thing #7: Using U: Speaking of devices, here's a BASIC 7.0 feature that really makes life easy on "U". As everyone knows, "U" is the prefix that must be included with the device number when you use one of BASIC 7.0's fancy disk commands (like DOPEN and DCLEAR). Even DIRECTORY works with "U". Just type DIRECTORY U9 to list the second drive's directory to the screen.

Thing #8: Directory Reading the Old-Fashioned Way: Since the 128 comes equipped with such a convenient directory command, one thing that everybody knows but may have forgotten is how to read the directory from within a program the old way—via the OPEN statement.

OPEN 2,8,0,"$:*"

Using this technique allows a programmer to get the directory data a byte at a time by using a simple GET #2,A$ loop. The advantage here is you can preserve the directory's contents in variables and use them in many ways. And, of course, you can open selective directories with the wildcard feature just like you can with the directory command.

Thing #9: ALT and his Many Brothers: One of the more mysterious things about the 128 keyboard is the top row of keys from ESC to NO-SCROLL. The question beginners ask is: "Is there any way to check if the ALT key is being pressed?" The answer is Yes. Simply include this line:

IF PEEK(211) AND 8 THEN . . .

That same memory address (211) will also tell you if the SHIFT, the COMMODORE key, CONTROL or CAPS LOCK key is pressed by changing the 8 in the line above to 1, 2, 4 or 16, respectively.

Thing #10: The Escape Codes: Another of those mystery keys on the top row is the first one on the left, ESC. It's common knowledge that this is unlike any other key in this respect: the operating system doesn't print it but instead waits for the next keypress to decide what to do. This happens not only in immediate mode (computer on but no program running) as well as program mode. Since we all have memorized the 26 built-in functions of the ESC key sequence (as shown on page 378 of the User's Guide), I won't cover them. But I must mention the one non-alphabetic Escape code—Escape-@ It's the best because it clears the screen from the cursor southward. Use this one a while and you'll hate going back to 64 mode for anything.

Thing #10-B: [ESC O]: Well, I have to point out one other ESC code because it helps you escape from programming jams which are caused by Commodore's famous quote mode. Just as [SHIFT RETURN] gets you out of quote mode, [ESC O] will too . . . with the added advantage that the cursor can stay put. This is more useful from within a program than in direct mode because that's where the quote mode can cause strange occurrences. Any time you have a situation where the user might type a quotation mark, it's a good idea to shut off quote mode by following with this:

PRINT CHR$(27)"O";

Thing #11: Window–Home: The Window statement, so useful to play with, has a quirk that is so well known that programmers never get stumped by it anymore. But back when they did, they used to scratch their heads when, after issuing a Window command, the next PRINT statement might not be within the window that had just been set. They soon discovered and the word spread that Window left a HOME keypress value somewhere in the computer and if the next Print statement started with a HOME (as they often do), the window was destroyed. (Remember, HOME HOME clears to the default window which is the entire screen.)

Related to this is another window quirk that surely no programmers in 1989 would fall prey to: the lost-line-link syndrome. This little demon wreaks havoc on BASIC program lines showing on the screen that are over one screen line (81+ characters) long. It shows up whenever you press HOME HOME.

What you might not realize is that all those double-long lines are now treated as single lines, and if you just happen to press RETURN on any of them, you will likely have just snipped off half of the line. You'll know something's up because the cursor, instead of jumping down two lines past the end of the double-line, will only fall to the start of the second line. How to avoid it? Just relist the lines you're working on after pressing HOME HOME.

Thing #12: Reversed, Colored Windows: It's odd, but this gifted feature of the 128's 80-column screen is seldom used. It works so nicely, so easily, that one wonders why. It certainly can't be because folks don't know. All the programmer has to do is place the screen in reverse mode with a simple [ESCAPE R]. Then, whenever he wants to create a colored window, he simply needs to change the present cursor color to whatever color he wants. He can do this with a COLOR 5,[1–16] (or any of the other ways permitted). And finally, he finishes by typing the window command making sure he places a comma–1 at the end to clear it. Like so:

COLOR5,6:WINDOW 10,10,20,20,1

The above will create a pretty green rectangle on the 80-column screen.

Aside: I've got a great window story. It seems this very dumb ethnic person had just gotten his Commodore 128 and he discovered windows. So he . . . aw, forget it. It's not that funny.

Thing #13: Error Lists: With just a tad of code when one begins a programming project, one can create an handy, error spotter. Two lines do this well-known technique:

```
0 TRAP 60000
60000 "[CLR/HOME] LIST";EL
60010 POKE 842,19:POKE
843,13:POKE 208,2
```

Thing #14: No-No Variables: Everybody knows that you can't use DS or DS$ or ER or ERR$ or ST or TI or TI$ as variables in your BASIC programs because they are reserved names used by the 128. And since everybody knows this, nobody ever wastes 20 minutes bug-hunting for bugs that aren't really bugs. Right?

Thing #15: Disabling Line Links: Line links, one of the 128's most subtle body cues, are what allow you to have up to 160 characters (four screen lines in the 40-column mode) per BASIC line. Great. But sometimes annoying, like when you don't want a blank line to be inserted when you type past the left margin. By setting bit 6

of memory cell 248 to 1, line links of the 128 can be disabled. It's easy to do: just include this line in a program: POKE 248, PEEK (248) OR 64 to shut off the linking feature or type: POKE 248,PEEK (248) AND 191,to turn it back on.

Thing #16: Re-initializing the Character Set: Many, perhaps most, 128 owners never do any serious work redesigning the 80-column character set. So it might appear they don't need to know how to re-initialize it if it gets goofed up. But many of them have programs such as *BASIC 8, News Maker 128,* etc. that do mess with the character set. That's why everybody knows that typing SYS 52748 will straighten things back out, even considering that you'll have to type it "blind."

Thing #17: Disk Reading: Most 128 folk have 1571 disk drives. Most know that the 1571 is smart enough to tell if a disk is single- or double-side formatted without any effort on the user's part. And I'll bet Dan Quayle's family estate that all of them know how to force the 1571 to go from double- to single-sided mode or vice versa. This statement:
OPEN 1,8,15,"U0>M0" puts it in single-sided (1541) mode and this one:
OPEN 1,8,15,"U0>M1" allows even a Commodore 64 to use the 1571's double storage.

Thing #18: Cheap Disks: One sure thing everybody knows is that cheap disks are as good as expensive one. And that it doesn't hurt anything to cut a notch in the right side and flip the disk over . . . unless you have the disk formatted in double-sided format.

Thing #19: The 1764 Connection: It took awhile (and a 1750 REU shortage) for everybody to become aware that the 1764 REU would work on a 128, warnings in the 1764 manual notwithstanding.

Thing #20: This and That: And finally, is there anyone left in the world who doesn't know that this symbol (&) is called an ampersand meaning *and.* Or that this symbol (@ is called "at" and at's what it means. Or that (£) is the symbol for the British pound, a monetary measurement. Or that three periods (. . .) is called an *ellipsis* and usually means an omission of words in quoted material or, as I often use it, just another way to pause the action . . . kind of a punctuational body move.

So until next time . . .

Inside Q-Link

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ing the F4 function key, or by using special keywords to go directly to special areas of the system. You can even set up a preferred area that you can automatically enter whenever you log on to the system.

Within each side of PC-Link are the familiar areas like on Q-Link. In the standard PC-Link features you'll find the Software Buyer's Guide; NewsLink Headlines for general daily news; Dollars & Sense investment information; Reference Desk with an encyclopedia, software catalogs and reviews, book lists and a college handbook; Entertainment Guide with movie and video reviews, soap opera summaries, travel services, horoscopes and more; Our World with opinion polls, general news and health information; Quiz Center; Home Shopping; Tandy Headquarters where Tandy users can get direct support; and the Customer Service Center for all PC-Link users.

The PC-Link Plus services include the familiar People Connection, structured very much like People Connection on Q-Link; Financial Center with online investment information; News Room for more detailed general or industry news; Learning Center with the Academic American Encyclopedia, Grolier's Reference Desk, Online College, tutoring and a college board; Community Center with various special interest clubs; Computer Forums for help or information on all sorts of MS-DOS-related topics; Software Library with thousands of downloadable public domain, shareware and demo software; Publisher's Connection for online support and assistance from various publishers; and The Mall where you can hunt for bargains or advertise things for sale.

Electronic Mail is available from all areas of the system, and even allows the transmission of files or sending a message to a number of people at one time. You can also review old mail, check the status on current mail to see if it's been read, and more. And best of all, the mail editor is identical to the message board editor on this system and includes a number of handy features, including the ability to upload your mail from a disk file on your system. Now you can easily compose and edit your Email offline and save valuable online time.

The message boards themselves include what are called "Folders," which in fact almost appear to create another layer of message boards. When you select a topic from a message board, that folder is opened, and you'll see a list of all the messages in that folder. You can then select any individual message in the thread and begin wherever you like. You don't have to display all the messages in a folder to get to the last message.

You can easily add new folders and add messages to existing folders. Plus you can even compose and edit your messages offline and upload them from disk. The only restriction is that your text files should be formatted with 69 or fewer characters per line, and each message should be limited to no more than about 4,000 characters. If you need more space, split your message into several smaller messages. Overall, the PC-Link message boards are extremely handy but a little slower to navigate than the message boards on Q-Link.

One important thing to remember on PC-Link is the way the information is displayed in the message boards and download libraries. When you first enter these areas, a small number of entries is displayed in a window on your screen. Using the cursor keys, you can scroll through the entries to select one that's of interest. There can be as many as 22 entries that can be scrolled through using the window.

At the bottom of the screen will be a number of "buttons" to select the desired function or action. The buttons are normally accessed using your TAB or cursor keys. If there is a "More . . ." button displayed, then there are still more entries in the current message board or library, beyond those viewable in the current window. You have to select the More button to page through the area, and then scroll through each group of entries in order to see everything that is there.

PC-Link has only been available for a short while, but the system has already accumulated a wide selection of files in the download libraries. There are separate libraries for Public Domain, Shareware and Demo files, each divided by subject to make things easier to find. The demo library in my New Product Information section, for instance, already has well over 200 demo files available in just a few short months. You can find this library and the associated message boards in the Publishers' Connection in the PC-Link Plus services.

That's about it for now, I'll be covering other new and exciting Q-link services in next month's column. Plus, next month we'll start to take a closer look at the services and features on PC-Link. As usual, if you have any comments or questions concerning this column you can reach me via Email to RBaker on Q-Link or via RBaker PC on PC-Link.

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to activate the partition by issuing the proper DOS command.

The Fast Loader module is used to speed up the operation of the 1581 with the 64. The module gives you the choice of where in the 64's memory it will be placed. You can also save the memory-specific module to disk for direct loading. In this form it can be loaded with the 1581 set to any device number. I found that the a 108-block file, which normally loaded in 55 seconds on a 64, came up in less than seven seconds with the Fast Loader installed. The Fast Format module provides a less dramatic, but still significant, improvement. With this utility a 1581 disk was formatted in about 68 seconds.

The Partition Creator module greatly simplifies the task of setting up and removing partitions on the 1581 disk drive. To create a partition, simply mark off the tracks you want on the display and enter a partition name. Partitions can be nested to any depth within the limits of the disk's capacity. However, the display screen shows partitions only two levels deep. The only way to find out if additional partition levels exist is to try to open them. If nothing happens you have reached the lowest level.

The last four modules are primarily for disk hackers. The operation of all these modules is restricted to 1581 disk drives. The Track and Sector Editor module lets you examine and modify the contents of the 1581's disk sectors in PET ASCII, hexadecimal and assembler format. When editing in the assembler format, you have to enter valid assembly code for the module to accept it.

The File Track and Sector Tracer lets you locate, examine and modify the disk sectors which are occupied by a program or sequential file. The first step displays a grid on the 64 screen with the sectors used by the file shown in yellow with the first sector marked by a flashing cursor. The complete track and sector grid fills two 64 screens. The cursor can be moved to any sector in the file which can be examined and edited. The address where the file would be in the computer's memory is shown at the top of the screen. Sequential files are all assumed to start at $1000 (4096). Sectors can be examined and edited in PET ASCII, hexadecimal and assembly format. This module can be invaluable for repairing or salvaging damaged files.

The Pattern Searcher Module lets you locate any byte pattern anyplace on the disk. The byte patterns can be entered in decimal, hexadecimal or PET ASCII formats. The data formats can be mixed for a single scan. Up to two lines of data can be used as a search pattern. The search is very fast requiring only one minute to scan the entire disk. The maximum number of matches is limited to 255. If this number is exceeded, the scan can be broken up by selecting a range of tracks. When done, the sector map is displayed with highlighted sectors that contain a match. The sectors can then be displayed in assembly format or in hexadecimal/PET ASCII with the matched pattern highlighted in either case. The sectors can be edited in either assembly or hexadecimal format.

Finally, the Error Scanner module is a combination error locator and disk usage indicator. The sector map is displayed in four quadrants showing the used sectors and sectors which have never been written to. DOS errors are displayed as the number 0 through 9 corresponding to error numbers 20 to 29.

The *1581 Toolkit* comes with a 43-page manual in a half-size, three-ring binder. The binder also contains *The 1581 DOS Reference Guide* by David W. Martin. This 147-page book supplements and goes beyond the manual which is provided with the 1581 disk drive. Here you will find details on undocumented disk drive commands, early hardware problems, using the burst commands, and hardware specifications. One 40-page chapter is devoted to a commented memory map of the 1581 ROM. This is not a detailed disassembly, but a functional listing.

Along with the book there are several utility programs on the distribution disk. Among them is a 1581 diagnostic program which checks the disk drive for known hardware errors. Also included is Kracker-Mon, a full-featured machine-language monitor which lets you work with either the computer's or the disk drive's memory.

Overall, the *1581 Toolkit* is the best utility package that I have seen for the Commodore 64 and the 1581 disk drive. Nevertheless, there is still room for improvement. I would have liked to have seen support for the Commodore 128's expanded memory and 80-column screen as well as for the 1750/1764 memory modules. *The 1581 DOS Reference Guide,* which is part of this package, should be required reading for all 1581 hackers. The inclusion of this book, and its accompanying utilities, make the package an excellent value.

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you watch closely, the seadog makes funny facial movements and even seems to smile.

Moving your seadog is rather easy with a joystick—just move the stick left or right to go that way on the tower, up to go into a tunnel or up an elevator, down to go down on an elevator, and press the fire button to jump or shoot snowballs (when you aren't moving). In no time at all, you should have the movements down pat, so you can work on getting the patterns right.

The only things that you have to shoot at in *Tower Toppler* are bouncing cannonballs, flashing walls and fish that you plan to catch. The first two obstacles you encounter on the tower. You shoot fish to paralyze them until you can run past them with your ship between towers. You have to be quick with your fingers to catch a lot of fish. As the game goes along, you get better at catching fish. Of course, more of them appear once you do get better!

Bouncing cannonballs move back and forth on a particular ledge of a tower. You can only shoot the colored ones; silver cannonballs can only be stunned for a few seconds. Flashing walls are immobile and just waste time until a new batch of moving enemy obstacles comes along.

The sound effects in *Tower Toppler* are also good. I've noticed that a lot of European releases feature great sound and even some commercial music in their soundtracks. American publishers have only recently picked up on this strategy. These companies know that excellent graphics and lousy music/sound effects do not make a big seller. From splashes when you hit the toxic ocean to snowballs bouncing off of the walls, *Tower Toppler* is musically rich, as well as graphically appealing.

Overall, I'd have to give *Tower Toppler* two thumbs up: one for being a great game and another for not trying to make the theme too pretentious. That little seadog character has got to be the cutest video game character since *Bubble Ghost.* Even his little green tail wags as he/she runs up and down the towers.

Tower Toppler has the right level of difficulty as well. Although I've played the game for hours, I still can't make it to the fifth tower. Certainly, I'm getting longevity out of the game. You will too if you try *Tower Toppler,* and you'll have a lot of fun trying to break the records on the disk as you get your video game "fix." Just keep that seadog out of the water!

**Also available for the Amiga.*

Continued from page 14

to the goal, when the avenue is clear, or the goalie is out of position.

The spinning Banana kick produces a long, wide curve, excellent for moving between opponents and faking out goalies. Use this high-flying kick at full strength for best results. Banana power—the degree of its curve—can be adjusted (low, medium, high) before each game.

Chip shots are short, straight kicks that jump the ball high into the air. Use them to avoid confrontations with oncoming opponents or to clear the ball from the goal area as quickly as possible. Chip shots can be used to set up goals, but rarely score by themselves.

A Scissors kick was popularized by Brazilian soccer legend Pele. This extremely difficult kick requires the player to juggle the ball in the air, jump, scissor the legs and fire the ball backwards over his head. Luckily, the computer version is much easier to execute, but still difficult to use effectively.

The strength of each kick is determined by the length of time the fire button is pressed.

Defensively, teams can change possession by intercepting passes, blocking kicks or tackling the ball. Tackling consists of sliding feet-first into the ball as your opponent dribbles by. A warning buzzer sounds when the ball enters your goal's penalty box, automatically switching control to your goalie. Beyond normal ball control, goalies can dive left/right or jump straight up to block shots. Use the diving block only as an emergency measure, since it takes time to recover, thus leaving the goal wide open.

Although gameplay remains nearly identical in both versions, the style of play is dramatically different. Due to the size of the field, outdoor soccer consists largely of defensive action and ball handling. The outdoor version also adds inclement weather to the list of user-defined variables. When you least expect it, lightning flashes and thunder claps as a torrential downpour sweeps the field. Suddenly a new dimension to the game opens up.

The smaller indoor version, surrounded by arena walls, plays much faster. Here, defense takes a back seat to an almost madhouse offensive game plan. Strategies to be learned include the use of the walls to bounce passes and set up goal shots. The goal areas are smaller, however, and the cramped quarters tend to cause claustrophobic reactions in some players. Indoor soccer is definitely an acquired taste.

Yet another special effect (used in both versions) is the Instant Replay. This feature can be turned on or off, but it's so much fun you'll never want to be without it. Following each goal, the action stops and actually backs up, using effects that simulate the look of rewinding videotape. The goal is then replayed, starting from the setup, switching to slow motion when the goal is made. It's a fabulous programming accomplishment.

The game's only drawbacks are the limitations in design. There are no penalties, injuries or substitutions during gameplay. Team statistics are also limited to simple won/loss records kept during league and tournament play. Finally, the "static" players—your teammates—are cheerfully devoid of any artificial intelligence. In other words, *you* are the brains and brawn behind the entire team. The computer apparently doesn't want to get involved. I guess for graphics this good you have to make sacrifices.

But if you're looking for pure sports thrills with eye-popping arcade effects, you won't find anything that even comes close to matching *Keith Van Eron's Pro Soccer.*

**Also available for the Amiga.*

Software Reviews/Final Assault

Continued from page 16

But climbing is not all there is to *Final Assault.* At different points in the game, you must respond to the needs of the mountain climber. Sometimes words indicating that the character is hot, cold, hungry, thirsty or tired pop up on the screen. You should immediately attend to the climber's desires or he may fall.

You do this by securing the climber in a strap and switching to the inventory menus, moving out of the rucksack whatever the climber needs. If he is hungry, select some meat or cheese. If thirsty, give him some coffee or milk. If hot or cold, take off or put on some warm clothes. If tired, you should make your way to the nearest glacier and set up a tent or sleeping bag.

This element of *Final Assault* is what makes it interesting. (If the game were all joystick moves, I would have blasted it long ago in this review.) By including these random events, *Final Assault* becomes a better simulation of mountain climbing and a more challenging game. What would you do if you ran out of food and you had just a few more meters to go?

There are many nice pluses to *Final Assault.* A meter on the left side of the screen shows how far you are up the mountain. The graphics are really good and offset the fact that there are hardly any sound effects in the game. In addition, you can choose whether your climb begins in winter or summer, and the weather acts accordingly up on the peaks.

If you keep your head and your joystick hand moving, you will be making it up the more difficult mountains in a matter of days. You can save your games in mid-climb too—a very useful option when you get frustrated.

Final Assault Falls Short

I have some beefs with *Final Assault* that can't go unmentioned. First of all, since the game is made by Epyx, you know that the manual is clearly written and well-organized. Unfortunately, the *Final Assault* manual is supposed to be valid for five different computers. This does not work. Although the package includes a Command Card for the Commodore 64 version, the combination of the two leaves a lot of unanswered questions and misinformation. For instance, the screen shots in the manual are from the ST version of the game, and the joystick movements described for ice climbing are not accurate. A better job could have been done here.

More importantly, rock climbing is very awkward and on more difficult mountains nearly impossible. On these mountains, I just gave up and threw my joystick on the ground. I almost never give up on a game. However, when you drop back to the bottom of the current screen every time you climb up a few meters, no matter how carefully you place your limbs, it's time to throw in the towel.

That wouldn't have been too bad, except that the rock climbing sequences of the training trail are just as difficult. That must have been a mistake. I'll give Epyx the benefit of the doubt.

Summary

Overall, Epyx did a fine job with *Final Assault.* If they correct the awkwardness and difficulty of the rock climbing phase of the game and customize the manual for each computer, the company would have a hit on their hands. Until then, *Final Assault* is still a pretty good game. It's also addictive. It would have been a complete simulation if Epyx would have included the descent of the mountain in *Final Assault.* Still, there are enough surprises (like the ending screens) and challenges to keep you happy.

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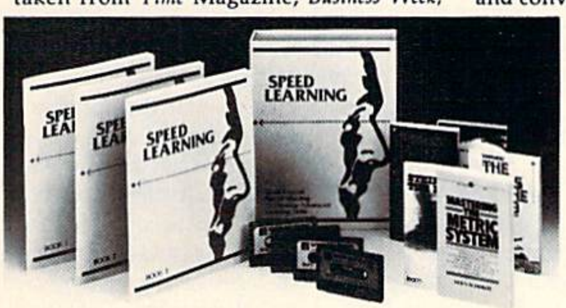
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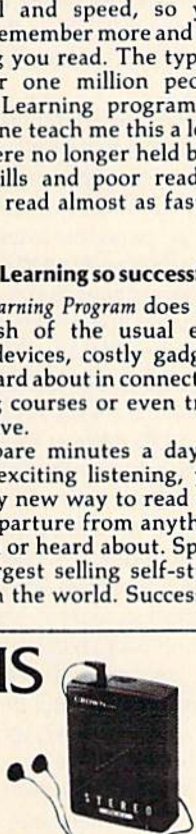
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Laser Rot

We expect things to work as advertised, events to occur as planned, and most of all, our computer and data storage equipment to function correctly. What would it be like if we couldn't count on a floppy disk drive to correctly store data, a monitor to display text as we entered it, or even a keyboard to pass the same characters to the screen as are printed on its keys?

Imagine if your videotape collection suddenly developed defects; video snow, distorted dialogue or loss of color. Six years ago these kind of defects and others began to show up in laser discs manufactured by Pioneer Electronics. The "perfect" format for video suddenly seemed no longer perfect.

Laser disc video has had a rough go of things from the very start. The original laser discs, from MCA DiscoVision and the now extinct RCA CED laser system, had problems as soon as they first shipped in the late '70's. Systems exhibited several types of defects: cross-talk, causing moving patterns of lines across the image; skipping, where the laser tracking would fail to track correctly causing a fast-forward-like effect; and video snow, confetti-like dots and streaks across the image caused by the inclusion of microscopic dust particles trapped between the disc's surface and the protective transparent overcoat applied to shield the disc from rough handling. By some reports the defect rate was close to 50%.

MCA DiscoVision eventually gave up, and Pioneer Electronics acquired the manufacturing rights to both the players and the discs. Pioneer improved the players, adding better focusing and tracking servos to overcome the cross-talk and skipping, and a "clean-room" process for disc production that cut the defect rate to below three percent. Laser discs began to look like a videophile's dream instead of a nightmare.

Then in 1983 reports began to surface of discs going bad. This syndrome was far different from the previous defective discs; those discs were defective as they came off of the production line. The new reports were of formerly good discs developing defects. These discs were literally rotting.

Laser rot is impossible to detect by visual inspection of a disc. The only way to tell if a disc has gone bad is to play it. There is also no way to tell which discs are susceptible to laser rot and which discs are immune. A clear understanding of the manufacturing process of laser discs can help us comprehend the process by which laser rot destroys laser discs.

> Just as no one is exactly sure what causes laser rot, no one is exactly sure what laser rot causes.

Oxidation

Laser discs are hot stamped from an acrylic resin. A master "stamper" is pressed against molten plastic in a mold. This impresses a series of tiny pits that are the actual information, the "bits" of the laser signal. To improve the readability of these pits, the entire disc is coated with a very thin layer of aluminum in a vapor chamber. Since laser discs are two sided, two finished discs are glued, back to back, to create a single two-sided finished disc. The finished laser disc is a sandwich with glue in the middle, aluminum coatings on either side of the glue, and the clear acrylic base on the outside surfaces. When a disc is played, the laser beam shines through the acrylic surface, is reflected off the aluminum coating, and bounces back through the acrylic surface.

Aluminum is very susceptible to oxidation. When aluminum oxidizes it loses its luster, its shine. This is the same process that turns exposed iron red, darkens cut fruit, and makes eggs go bad. But since a laser disc is a sealed unit, where does the oxygen come from? There is no shortage of possibilities. The glues used to cement two single-sided discs together are organic-based, and at least three different glues have been used since double-sided discs were first manufactured. It is possible that one or more of these glues either contained absorbed oxygen, were involved in some kind of oxidizing reaction with the aluminum coating, or that air bubbles were trapped between the glue and the aluminum coating.

In fact, Pioneer made an official statement; in October 1985 the company reported that a bad batch of glue had been used in discs manufactured between the third quarter of 1984 and the first quarter of 1985 at one of their stamping plants. As admirable as this admission was, it was not the only cause of laser rot. Discs manufactured both before and after the published dates had also gone bad, as well as discs manufactured at other stamping plants. It was obvious that a single batch of bad glue was not likely to be the sole cause of the problem.

If you were to closely examine a laser disc, you would notice that the aluminum coating extends to the edge of the disc at both the spindle hole and outer circumference. Although these exposed edges are very thin, they are open to the environment. And should the bond between the glue and the aluminum either be less than perfect or fail at some point in time, these exposed edges could become channels for oxidation.

CD's Immune So Far

It's far more likely that you have a compact disc, the audio cousin of the laser disc, around to examine. And if you do, by now you are probably concerned that laser rot may attack your CD collection. You can relax for now, as there have not been any reported cases of laser rot infecting CD's.

There are several good reasons for this. The first is that no glue is used in creating CD's, as they are single sided. The exposed aluminum coating is covered with a lacquer protective overcoat instead of being cemented to another disc.

The second is that if you look closely at the inside and outside edges of a CD, you will notice that the aluminum reflective coating does not extend to the outside edges. It is completely sealed inside the disc by the lacquer overcoat on one side and the disc medium on the other.

The third reason is one that you cannot see. The disc medium is a different material than that of a laser disc. Laser discs are stamped from acrylic resin, CD's from polycarbonate resin. There is a theory (as yet unproven) regarding the acrylic resin that proposes that a chemical reaction between the resin and the aluminum reflective coating is the cause of laser rot. There has been no scientific study on this theory, but it may help explain why CD's have been so far immune to laser rot.

Consequences of Laser Rot

Just as no one is exactly sure what causes laser rot, no one is exactly sure what laser rot causes. Precisely what goes

on inside a laser disc that has laser rot is unknown, but at least two theories have been put forth.

The first suggests that as the aluminum reflective coating oxidizes, its reflective index decreases. This causes a rise in the signal-to-noise ratio on the returning laser beam, resulting in video snow, audio and video dropouts and audio noise.

The second theory suggests that as the aluminum coating oxidizes it distorts the shape and size of the pits as seen by the laser beam. This causes a change in the actual data being returned by the laser beam. Since the laser disc player converts the digital data to an analog video signal, these distortions are translated into a defective display. If the digital data were being used directly, for example as program data in a spreadsheet, the results could be a change in the bottom line that went unnoticed until the auditors checked the books.

Rot Prevention

If you own or use laser discs there are only a few steps you can take to increase the odds you won't be hit by laser rot. If laser rot is caused by bad glue or oxygen intrusion via the exposed edges of the disc, you can't do much to protect yourself. Keeping your discs away from heat is a good idea no matter what. Thermal expansion or even minor warping could cause microscopic stress fractures in the bond between the two sides of the disc, letting air inside.

Although it has been recommended in the past, washing your discs with water or other solvents should be avoided. Try wiping your discs with a clean dry cloth instead.

You should also remove your discs from the player as soon as you have finished watching them. Players do heat up when they are in use, and they retain some of that heat even after they have shut off. Also, a disc is suspended from the hub ring during playback. While it is actually playing, centripetal force acts to support the outside edge of the disc, but once the player has stopped this is no longer the case.

Pioneer Electronics, through its marketing division Laser Disc Corp., is to be commended for standing behind their products. Every defective disc brought to their attention has been either replaced or a refund has been given. They have been a little less forthcoming regarding information on laser rot, but this may be understandable. The laser disc industry has been slow in maturing. The total number of titles available is around 3000, and in 1988 only about 120,000 players were sold. That number is expected to increase by 50% by the end of 1989. If laser rot were to become a headline story—even within the video community—it could impact severely on the saleability of any laser disc product, disc or player.

Pioneer believes that the problem has been solved. Discs that have been manufactured recently seem to bear this out. It is still possible to buy a new disc that either has laser rot or will develop it, but these are discs that were manufactured several years ago and have been sitting in dealer inventory since.

On the other hand, laser discs still have the aluminum coating running right to the edge of the disc, and they are still being made from acrylic resin. Perhaps it was just bad glue, perhaps not.

False High-Tech Security

There is a technological moral to this story. When laser discs were first introduced they were touted as the ultimate video medium; indestructible, soon to be the preeminent video distribution format. Salespeople would bounce discs off the floor, stand on them, handle them with no regard for fingerprints—all to prove their durability. They were described as never wearing out—how could they when the only thing that touched them was a beam of light?

A false sense of security often comes with the latest technology. We have had the benefit of so many new high-tech toys, but we have not had the opportunity to develop a folklore of caution to accompany our new tools. How many of us can remember our first exposure to a wrench, a record player, an automobile, and the careful instructions in their use, the dangers of misuse or inattention? How much attention do we give to the instructions for use or storage on products today?

Do you know what the expected life of a floppy disk is? Or how to properly store a videotape? Have you been eagerly following the development of erasable optical discs that can store 500MB of data and noticed no information on what the useful life of one of these discs is? The next time you spend the weekend balancing your checkbook on the computer, or word processing your version of the great American novel, take a moment to think about how fragile a hold that floppy disk has on your data. Then take another moment to make a backup.

Continued from page 30

for kids.

"Pirates of the Soft Seas" casts the child and a friend as treasure hunters. To find the treasure buried on Disk Isle, they must unravel clues gleaned from a band of pirates led by Fierce Frank and his sister Terrible Tess.

The second story, "Fossils Alive," introduces the player to Dyna Saurus, an inveterate fossil hunter. Required to gather information for a class assignment, Dyna and the student embark on a fossil-hunting expedition. Together they enter a time warp where carnivorous dinosaurs and other winsome threats to life still live.

Both adventures contain graphics and some sound effects—a picture of a sabertooth tiger accompanied by its roar, for instance or a pirate with his knife clenched in his teeth. In "Pirates," the student moves two animated kids around an island to search for the treasure and unravel clues. The gender and names of the treasure-seeking kids are chosen by the player. Movement is generated from the keyboard, joysticks are not required. "Fossils" contains limited animation.

As each story progresses, students are offered choices at decision points. Their decision affects the progress as well as the outcome of the story. Although the two adventurers are complementary in scope and intent, important structural differences exist between the two.

"Fossils" plainly encourages decision making, players encounter up to 14 decision points while reading the story. Conversely, "Pirates" requires more in the way of problem solving. To discover the treasure's location, players must solve an anagram and a rebus.

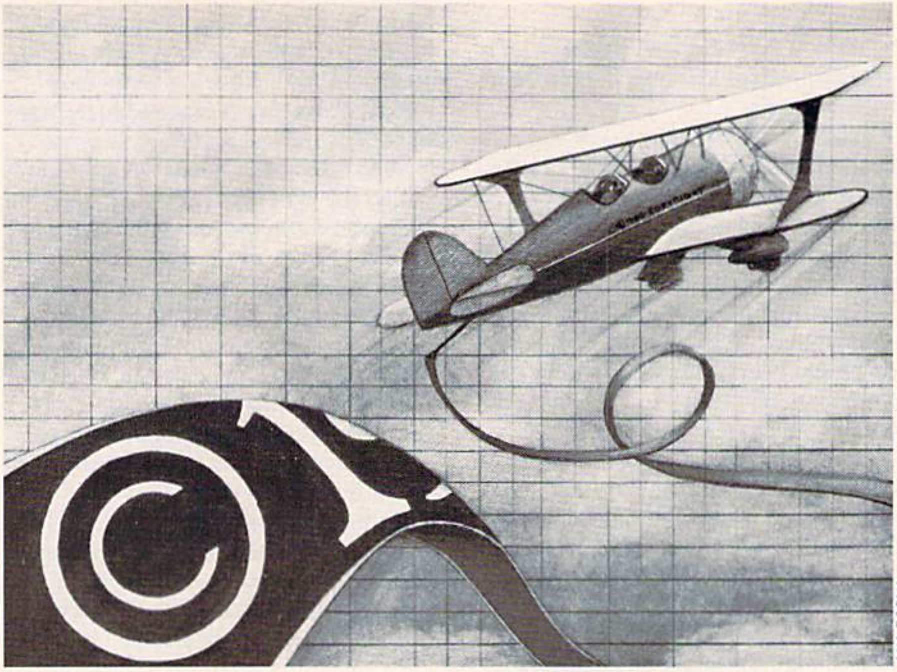
The treasure is a chest filled with "pirated" computer software, and therein lies a moral message from Scholastic I think the program could easily have omitted.

But I can understand Scholastic's position, since they publish and distribute some of the finest educational software. Their lively 100-page academic catalog is free to educators.

Tales of Discovery is from Scholastic's interactive fiction series, all of which stress reading and decision-making skills. The series, appropriately named Twistaplots, requires students to decide between two discrete choices. Even if the worst choice is selected, it's the story that ends abruptly—not the character's fictional life. Players are never left swinging from a yardarm, made to walk the plank, or consumed by a monster.

by David A. Weinstein

Changes in U.S. Copyright Law Affect Everyone



MIA BOSNA

March 1, 1989 was an important day for software programmers and other owners of copyrightable works. This was the effective date for amendments to the Copyright Act of 1976 (Act), the federal statute which governs copyright protection in this country. They were made by the Berne Convention Implementation Act of 1988, signed by President Reagan on October 31, 1988.

Among changes in the Act, the most significant are elimination of the requirement that a copyright notice be placed on publicly distributed copies of protected material, and addition of language which enables the U.S. to become a party to the Berne Convention for the Protection of Literary and Artistic Works (Berne Convention). This is the oldest as well as most important and effective multilateral treaty governing international copyright policy. It gives American copyright owners the right to automatically receive legal protection for their works in many foreign countries without doing more than creating them.

For more than 100 years, compliance with the notice requirement has been part of our law as a condition of avoiding the loss of copyright protection. Nonuse of a notice could result in the loss of all rights. However, now that the notice requirement has been eliminated, creators of protectible material do not have to be concerned about losing their rights if a notice is not used. This is good for copyright owners but is likely to be of concern to many persons who use protected works.

As in the past, creators of copyrightable works are immediately entitled to legal protection for their material on the date it is created, without doing more. And, as a general rule, this protection will continue to be a period equal to the life of the creator plus 50 years. But since March 1, it's much more difficult for users of material created by others to know whether it is protected by copyright if a notice is not on it. Appearance of a copyright notice on artwork, books, motion pictures, records and other material usually is the only way to readily tell whether it is protected.

Persons who use material created by others without checking its copyright status, risk incurring liability for infringement. The absence of a notice on it no longer means it is not protected. An unauthorized use of protected material may be infringement of one or more of the owner's exclusive rights. Only the copyright owner is entitled to copy, vary, publicly perform, display and distribute protected material.

Although use of a notice is not required to obtain copyright protection or to avoid losing it, there is a good reason why owners should continue to place it on their works. By doing this, they can defeat claims of innocent infringement by persons who use protected works without authorization. This means they can obtain all available remedies for infringement, including injunctive relief and damages. This is not the case when there is an innocent infringement. The remedies against innocent infringers are limited. An innocent infringer is anyone who copies a protected work that does not feature a notice, publicly performs it or otherwise exercises an owner's exclusive right.

For many years, American copyright owners have been able to protect their works in foreign countries. This kind of protection is referred to as "national treatment." However, it is not necessarily the same as that given by U.S. copyright law. The protection available in a foreign country is determined by the law of that country. Therefore, national treatment means a country will give the same kind of protection to the copyrightable works of foreign nationals that it gives to its own nationals. For example, under national treatment an American author can expect legal protection for his or her literary work in France to the same extent France grants protection to literary works created by French citizens.

Prior to March 1, American copyright owners were entitled to national treatment in the 76 or so countries that signed the Berne Convention. They were also entitled to national treatment in more than 40 of those countries by reason of another multilateral copyright treaty known as the Universal Copyright Convention (UCC). Some countries are parties to both treaties, while others such as the USSR have signed only one. Before March 1, the U.S. was a party only to the UCC, which it signed in 1954.

To receive national treatment in UCC countries, both before and after March 1, 1989, American copyright owners are required to use a specific form of copyright notice on their works. This is necessary to satisfy any formalities set by a UCC signatory country as a condition of its granting national treatment.

On the other hand, to receive national treatment in Berne Convention countries prior to March 1, 1989, American copyright owners were not required to use a notice. But it was necessary for them to do something else. As nationals of a non-signatory country they were eligible for protection under the Berne Convention only

Continued on page 87

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All About EPYX

by John Jermaine



The music department gets together for a "Class of 1989" photo in front of Redwood City headquarters.

Last July I told you about Epyx's *Games* line and how it evolved over the years. But there is much more to the Epyx story than just the *Games* line. Ten years ago, a small company called Automated Simulations started producing personal computer software. It was a small company by industry standards, but it was a group of dedicated people with some great ideas. That company is now called Epyx Inc., and ten years has changed both the computer software industry and the company. Epyx remains successful however, because they are still a group of dedicated people with great ideas. Here then is the rest of the story.

Jon Freeman, the creator of popular programs like *Archon* and *Murder on the Zinderneuf*, helped to get Automated Simulations officially off the ground. In 1977, he met Jim Connelley through his playing of Dungeons & Dragons™. Connelley purchased a Commodore PET computer and used it to keep track of monster statistics, hit points and other related stuff.

Six months later, Connelley was developing his first home computer game. When he started having trouble, Freeman offered to help him on the project (even though he knew next to nothing about computers). That first program, *Star Fleet Orion*, was a simple TRS-80 space shoot-'em-up game. Automated Simulations was created to market that product. The new company was officially founded in Jim Connelley's dining room, and business was conducted out of Jim and Jon's spare bedrooms.

Temple of Apshai was a multi-person collaboration. Freeman was largely responsible for the design of the game system, Connelley did most of the programming, and Jeff Johnson contributed many of the game's features (the dungeon design, what monsters were present, the layout of the building, etc.). Johnson also came up with the title for the game. He claimed *Apshai* was the name of some obscure Epyptian god or goddess. Jon was busy while *Temple of Apshai* came together, so most of his contributions to the project were actually made over the phone.

Although Freeman liked the finished product, he didn't approve of certain elements it contained. For example, Mithril (sometimes called "true silver") illustrates his point. It is a magic metal that was invented by J.R.R. Tolkien for his book *The Lord of The Rings*. The term was "borrowed" by several fantasy role-playing games (including *Dungeons & Dragons)*, and unfortunately, it also found its way into *Temple of Apshai*.

Freeman discovered this factor, and similar transgressions when it was too late to make the necessary changes. Jon would have preferred the name *Electrum* or *Orichalcum* in its place. These fanciful materials are fairly well know in history and were reputed to have magical powers. As *Temple of Apshai* was hitting the market, Freeman and Connelley had a series of business-related arguments. Jon and his wife Anne Westfall officially left the company on Thanksgiving day of 1981.

Bob Botch, formerly vice-president of marketing and development, recently left Epyx to form his own software development group. Botch had been with the company for many years and was happy to talk about the good old days.

John Jermaine: What do you remember about the early days of the company?

Bob Botch: Jim Connelley founded Automated Simulations in 1979. He sold his first Dungeon & Dragons-type games to friends and through the mail. They decided these programs were pretty good, so they encouraged him to sell them in computer stores. And the company grew from there. It's interesting to note that the packaging of that era consisted of placing a diskette and tiny user's manual within a clear plastic bag. I hate to think what it costs to produce packaging and proper documentation today. Programs like *Crush, Crumble, Chomp* and *Temple of Apshai* firmly established Automated Simulations within the industry.

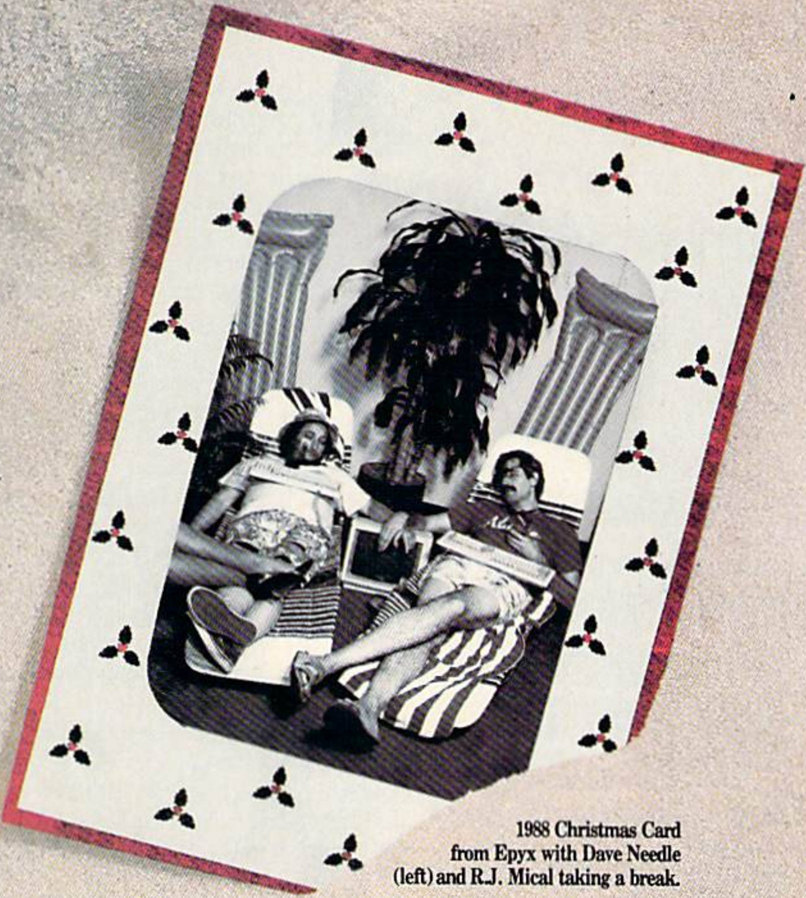
In 1982, Connelley sought out venture capital funding, and several companies agreed to provide the money. Shortly after receiving the good news, we changed the name of the company to Epyx. Our first choice was "Epic," for the epic nature of our games, but that title already belonged to Epic Recordings. So we decided to take a high-tech approach and came up with the name Epyx.

Jermaine: Did you have specific goals at that time?

Botch: Our original plan was to become a major figure in the home computer software industry. I think the company has met this goal.

Jermaine: Tell me about some of your early software titles.

Botch: One funny story immediately comes to mind. I had been with the company for seven days and really didn't know anything about computers. So the company decides to send me to the Consumer Electronics Show in Las Vegas (in January of '83). Epyx was so small at the time that they couldn't afford a hotel room. Instead, they rented a room in a condo for a week, somewhere off the beaten path. I also had to share it with the vice-president of sales.



1988 Christmas Card from Epyx with Dave Needle (left) and R.J. Mical taking a break.





Halloween 1988 at Epyx.

CHARLES BARTHOLOMEW



Temple of Apshai



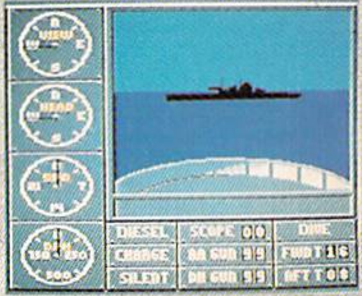
Jumpman



Impossible Mission II



Pitstop II



Sub Battle Simulator

Anyway, we were meeting with our first rep group at 9:00 a.m., and it was already 8:30 in the morning. My partner came over and said oh, by the way, here's a new program I thought you should see before the meeting begins. I looked at this flat object, he had handed to me, and asked him what to do with it. He said you put it in that little slot over by the computer. I did that and asked him what to do next. He told me to turn on the switch, located on the backside of the unit. I did that and followed his loading instructions, but the game still didn't work. We looked at each other this time because neither one of us knew what to do next. So I called the office, located a programmer who had come to work early, and asked him to walk me through the program, step by step. Now I was ready to demonstrate the game for our distributors.

We borrowed a big-screen television to give our people an impressive look at the new role-playing titles. But I displayed the other game every chance I got. Then the president of the company would come over, yell a lot and tell me to take the disk out. Whenever he left the room, I'd load the program in again. To make a long story short, we left that show with a ton of orders for *Jumpman,* the incredible new action game I had fallen in love with.

In case you haven't heard of the program, it contains a neat little guy who climbs ladders, leaps to different platforms, avoids things coming at him, and so on. As we ate breakfast on the final day of the show, the vice-president of sales commented that I'd better get that thing in a box and sell it, or the boss would have my hide. Three weeks later, I had the packaging ready and we were shipping the product out the door. *Jumpman* (developed by Randy Glover) was definitely a departure from our traditional games and ushered in a new era. Incidentally, it was one of Epyx's first big hits.

Jermaine: How did you market software at Epyx?

Botch: As you probably know, we took a different approach to marketing our software. I learned a lot during my first day on the job. I was sitting behind my desk, which was pretty empty because I wasn't sure what I was supposed to be doing there. Someone came in, gave me a diskette, and said here you go. So I replied thank you, what is it? Oh, it's a brand new game you have to figure out—give it a name and package it for shipment. It didn't take me long to realize this is not the way to get a product to market.

So we gathered all the marketing and development people together and spent an afternoon brainstorming ideas and concepts. The feedback was absolutely incredible. Everyone had a say in the future plans of the company. Programs like *Pitstop, Summer Games* and *California Games* were born in this manner. And the procedure is still used today.

Jermaine: Speaking of *Summer Games,* did Epyx try to become a licensee of the 1984 Olympic team?

Botch: Late in '83, shortly before the Winter Olympic Games took place, we thought about getting a license to develop an Olympic-style product. Obviously we were a little late for a winter game, since it takes us six to 12 months to create a program of this nature, so we concentrated on doing a Summer Olympics project. Unfortunately, we soon discovered that Atari had already become the official licensee of the 1984 Summer Olympics. This information put an end to our quest for the license, but we still wanted to do the program.

Jermaine: Where did the name *Summer Games* come from?

Botch: With Atari holding the Olympic license that year, we had to be careful not to step on their toes. This meant Epyx couldn't use a title that directly referred to the Los Angeles Summer Olympic Games. *Summer Games* was a strong title that kept us out of trouble.

Jermaine: What happened after *Summer Games* was released?

Botch: We made a lot of money. *[He laughs.]* Seriously, it was the beginning of our popular *Games* line, which has done very well over the years. The support of our followers convinced us to do *Summer Games II,* another multi-event program. Then *Winter Games* came along in 1986. *World Games* challenged the player to participate in traditional contests in many different lands, while *California Games* brought west-coast hobbies and pastimes to personal computers around the world.

After all of these products hit the market, we suddenly realized another Olympic year was fast approaching. We quickly started negotiations with the U.S. Olympic Committee and eventually worked out a deal. *The Games: Summer* and *Winter Editions* were the fruits of our labor.

Jermaine: In recent years, Epyx got the rights to Godzilla for *The Movie Monster Game.* Would you tell me about that experience?

Botch: In the beginning, *The Movie Monster Game* was slated to feature a selection of totally original creatures for the player to control. As the program evolved, however, we found ourselves developing a character which closely resembled Godzilla. Our people had reached a point where they had to make some quick decisions. Would it be to our advantage to license Godzilla for the game, and if we went this far, could we pick up the rights to other famous movie monsters for the program?

Research on the subject revealed that Godzilla is one of the most popular movie monsters in existence. A new Godzilla movie had been released in '85, Dr. Pepper produced two commercials featuring the giant lizard, and toy makers are still manufacturing models of the creature. These were all good signs that the public was genuinely interested in the subject.

Negotiations for this property went well because we were far enough along with the project to show the licensing agent exactly what we wanted to do with their character. Our people even had a sample of the packaging art for his inspection. We also had another factor in our favor. The agent representing Soho Co. Ltd had been marketing the title for a long time. We came to an early agreement without encountering one major stumbling block.

Once the Godzilla contract was secured, we returned to the idea of licensing other famous movie monsters for the game. Unfortunately, every creature we were interested in was owned by a different company. There was no way we could put together a blanket deal for the rights to several of these creatures.

Jermaine: Did you have any negative thoughts on the matter?

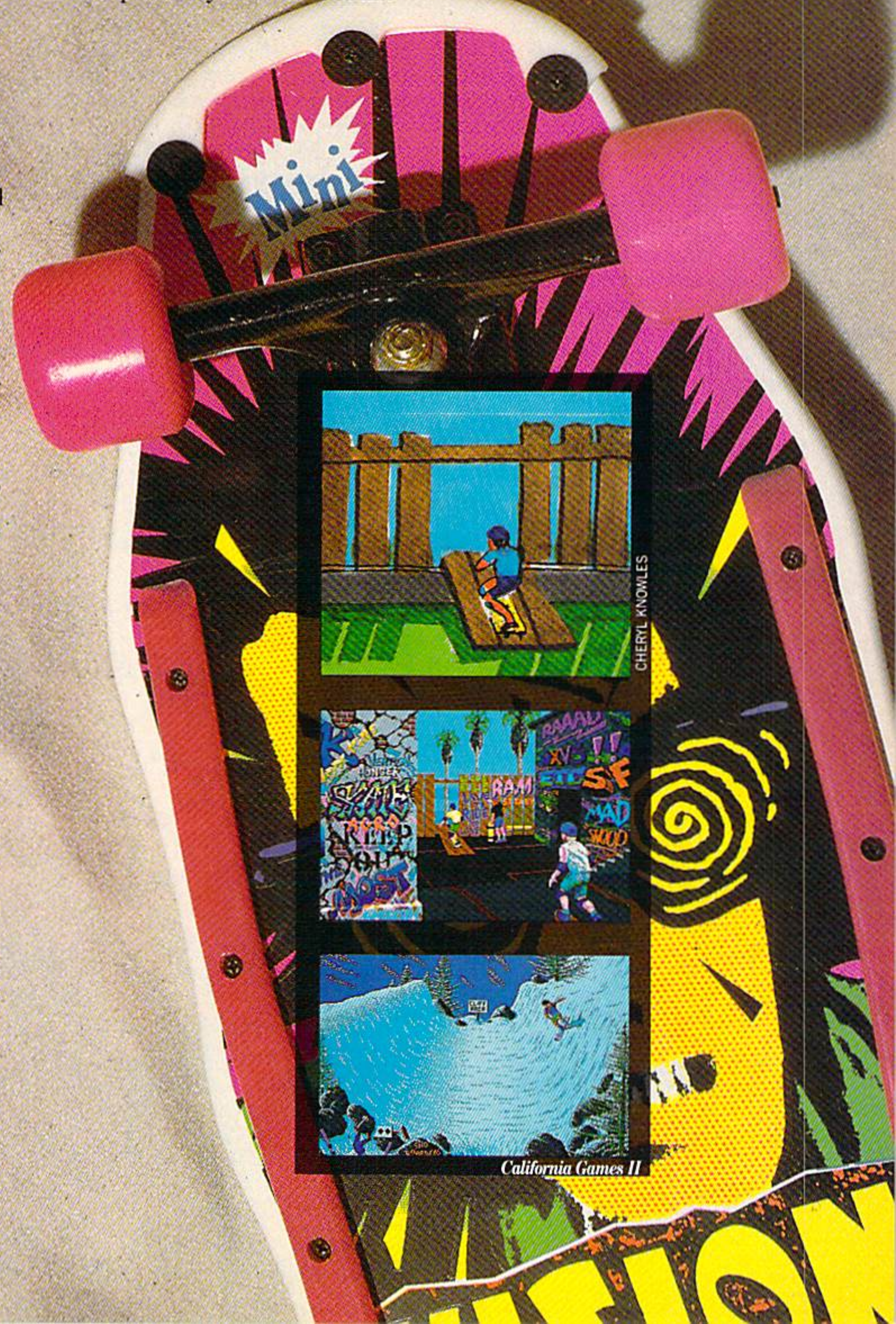
Botch: Yes, we did. Epyx was very sensitive to the fact that Godzilla has traditionally been a bad monster. It destroys private property and occasionally eats or kills human beings. We were so concerned about public reaction to the project that we tested the *Movie Monster Game* concept on a group of parents. Some of these individuals gave us a negative response, but the majority of the adults accepted the material as a light-hearted spoof. There is no point in the program where people are actually eaten, or come to an equally terrible end. Epyx has always projected a positive software image, where any member of the family can use one of our products.

Jermaine: Did you consider licensing big name wrestlers for *Championship Wrestling*?

Botch: We did, but the negative factors of the issue outweighed the positive ones. If we licensed a character like Hulk Hogan, for example, we would be restricted in how he could look on the screen, and what he was capable of doing in the program. Two licensed names would increase our woes because both individuals would want top billing, and sooner or later, we'd have to determine which character was stronger than the other one. To keep things simple for our game designers and marketing people, Epyx decided to create totally new wrestlers for the program. After all, we could incorporate any traits we liked into original characters. Our programmers also had more room to be creative and didn't have worry about the stipulations of a contract.

Impossible Mission *also hit the market in 1984. It was the brainchild of Dennis Caswell, an innovative developer who helped pioneer the use of synthesized voice in computer games. Caswell is 32 years old, his hobbies and interests include: collecting wind-up toys and bizarre postcards, while not losing sight of the finer*

Continued on page 69



CHERYL KNOWLES

California Games II

First there was Desktop Publishing, followed by Desktop Video, and now there is quality Desktop Music. Creating serious music—which once required orchestras to perform and expensive sound studios to record—can now be done at an Amiga keyboard. Countless professional musicians and sound engineers are discovering the Amiga and are turning to it to forge their music.

But happily neither of those titles (musician or engineer) are prerequisites for creating, editing, recording and performing professional-sounding music or sound effects. Just as you don't have to know the difference between a pentatonic and a major scale to know what sounds are pleasing to your ears, you don't have to be a musician to coax impressive music and sound effects from your Amiga. You just have to have an ear for music and the desire to make it happen.

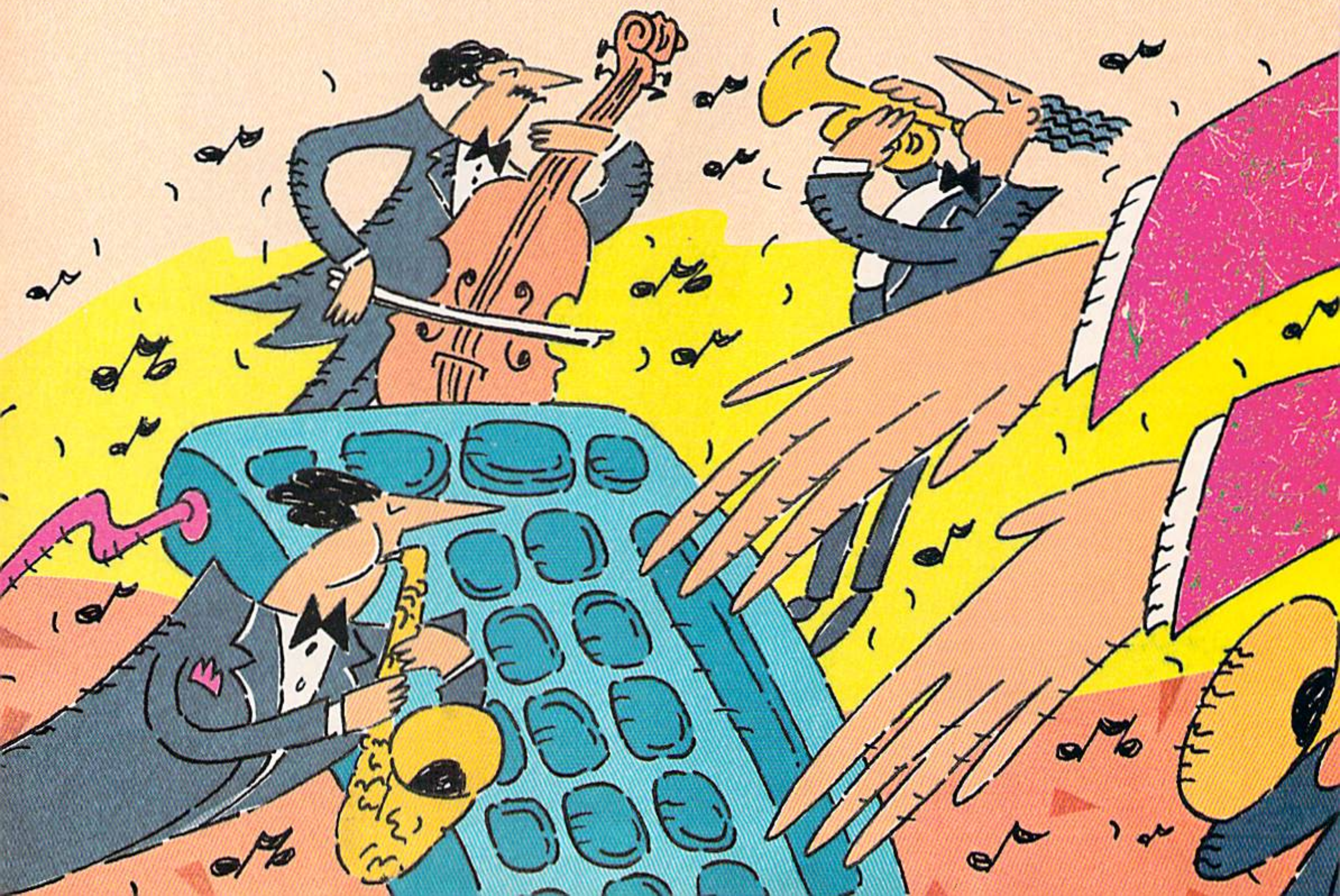
Anyone who has been around an Amiga for any time has to be impressed with its full-range sound abilities. The machine can make beautiful music, talk, capture and replay real-life sounds or synthesize unearthly ones.

When I began researching this article I wanted to find out how I, a non-musician, could get into my Amiga, dig out the sound or music I want, and then replay it according to my specific needs. I spent the better part of two months talking with software developers and musicians to get the answer.

David Brown and Al Lewis, two North Carolina musicians, are mixing their talents and the Amiga's power to accomplish their musical goals. If any one word can describe their impression of the Amiga as a professional musical tool it is *exciting*. Both men spent over a year researching the abilities and advantages of using computer-aided or -created music and sounds, and deciding which system and software offered them the most potential. After comparing all the systems on the market, both decided on the Amiga because of its power and price. In fact, it was their interest in the Amiga that brought the two together—at an Amiga user's group meeting. Because of their parallel interests, the two musicians decided to combine their talents and see how far their music and the Amiga could take them. The two cooled their keyboards and took off their headphones long enough to answer some questions.

Gary Fields: How did you two get involved in music and computers?
David Brown: I started out in high school playing guitar. I like doing that. About six years ago I went into a study mode where I was intent upon improving my musical abilities. After doing that I decided I wanted to perform with other people—a band. Well that turned out to be a big hassle. It wasn't easy getting people together on time. We did it for two years and learned a lot, but it wasn't too productive. I wanted to control all the music. I wanted to be able to tell the drummer how I wanted a piece of music to sound, but lots of times the guy in the band didn't want to play it that way. He had his own idea of how it should sound. Well my drum machine won't talk back to me. It plays it exactly how I tell it to play. It may not be right, but it does exactly what I tell it—I like that control.

I bought a drum machine and was impressed. Then I started reading a lot about MIDI and collected hardware as I needed and could afford it. I spent about a year trying to decide what was the best music computer for the dollar and settled on the Amiga.



SOUND INVESTMENT

by GARY V. FIELDS



JIM LAMBRENOS



David Brown (left) and Al Lewis break to discuss a change during a recording session. The sheet music they are discussing was composed with a combination of different software packages, but finally loaded into *Deluxe Music Construction Set* for final editing and printing.

Every time I invested in a new piece of equipment, my interest grew, because each purchase let me see more of the potential computers and MIDI offer the serious musicians. I've tried to limit my hardware purchases to around a thousand dollars per year, but I admit there have been years when I have exceeded that limit. I keep my wife happy by writing music about her. I guess I have more than $5000 in hardware plus musical instruments.

Lewis: I've been involved in music and different instruments since I was small. Everybody in my family plays an instrument. I got interested in keyboards when I was about 15. I started with a piano and moved up to an electronic keyboard and synthesizers. I got interested in computers because my keyboard had a set number of instruments. After a time I got bored with those and wanted to add more. I studied the different computers and read every music magazine I could find which described computer music. It just seemed logical to add a computer to my set-up because the computer allowed me to add any instrument I wanted. Once I decided a computer was what I needed, I started researching which computers and music software were available.

The Amiga was just the logical choice. I play by ear—I don't read music. But with a sequencer I can let the computer read the music into its memory and then let the software translate it into traditional musical notations. I can then fine tune it and print it from within the software. I've been using *Deluxe Music Construction Set* for about a year now, and not only does it let me do that, but I'm also learning to read music.

When I went looking for a computer it was with the idea of using it for music—nothing else. That's why I decided on the Amiga. It offered everything I wanted—including software—and it was affordable. The fact that it is great for other things is just a plus. I chose it entirely on its musical merits.

Fields: Why do you perform synthesized music? Why not use traditional instruments like pianos and violins played by live performers?

Brown: I love traditional instruments, and I enjoy performing with other musicians—that's why Al and I are working together. But unless you have a contract with a major recording label, hiring musicians is prohibitive. It's a lot of fun getting together and jamming with other musicians, but it can be a hassle too because schedules, and sometimes artistic tempers, conflict. Not to mention the problem of finding an affordable practice location where everyone and their gear will fit.

Lewis: Economics play a big part as well

Continued on page 75

Desktop Music Terminology

analog – a situation in which numerical data are represented by analogous physical magnitudes or electrical signals – the opposite of digital.

beat – the basic unit of musical time.

channel – a pathway from the computer to a MIDI instrument, or from a MIDI instrument to another, on which information is exchanged. Identified by a number.

digital – a situation in which quantities are represented as digits usually in the binary system.

envelope – this is the overall "shape" of a note in terms of its output level. When you play a note, typically the sound rises to some level, then falls to another level, and, when you release the key, falls to zero level – although there are many exceptions.

frequency – the number of repetitions per unit time of a complete waveform, such as a sound wave. The frequency determines pitch.

half step – an interval equal to a half a tone in the standard diatonic scale.

measure – a musical unit containing a specified number of beats, divided from other measures by a beginning and ending bar line.

MIDI – stands for "Musical Instrument Digital Interface." MIDI is a nonproprietary "language" which allows different (or identical) synthesizers to "talk" to each other and/or computers. MIDI-compatible instruments made by any one manufacturer should generally be capable of causing other manufacturers' MIDI-compatible instruments to play, and to switch from one patch to the next.

MIDI interface – the hardware link that establishes communication between the Amiga and a MIDI instrument.

octave – the interval between two tones which have the same pitch name. There are twelve half steps in an octave.

patch – an instrument setting on a MIDI instrument; for example, the "Flute" patch.

pitch – the relative position of a tone in a scale, as determined by its frequency.

staff – the group of 5 lines and 4 spaces on which notes are written.

synthesizer – a machine having a simple keyboard and using solid-state circuitry to duplicate the sounds of musical instruments.

tempo – the speed of a song, the pace at which it is performed.

track – a separate recording which is combined with other recordings to make a master recording so that all sound simultaneously.

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Music Software

Bring the Beat to Reality

Thanks to some talented musicians and programmers, giving life to the tunes buzzing around in your head is easier than ever. You don't have to be a musician, a programmer or any combina tion of the two to translate your thoughts to sound waves. You don't even have to be able to read music—you just need an ear for music.

The Amiga combined with music software supplies lots of shortcuts to bring life to your music. In most cases you can simply boot the program, and providing you have any required hardware attached, instantly hear musical responses to your input. It is fair to say that the more you know about how sound and music are constructed, the faster you'll progress in creating your own unique music and sound effects. But because most of the Amiga software is intuitively designed, you can learn a lot about sound by simply "twisting the dials" and then listening to the results. Once you have a sound effect or score you are pleased with, you just save it to disk where you can either access it later for refinement or play it back through another program or actually print professional-looking sheet music.

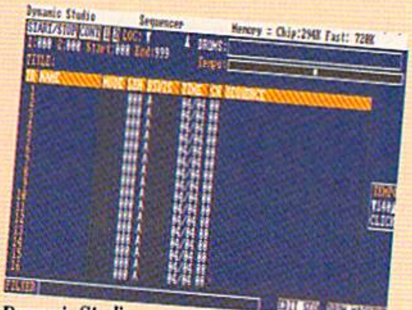
Most programs have playback modules which make it easy to listen to sound files. Using one of these players, you could create a computer jukebox to entertain yourself or your friends. If you are a programmer or someone interested in desktop video, you could use your sound effects and musical scores to add the finishing, professional touch to other projects. An obvious use of a sampling program/hardware product would be to capture real-life sounds to add to your animations or videos. To include your own, all you need to do is move the sound file to a drawer where the animation or video can access it, then use the parent program's sound requester to activate the file at the appropriate time. One of the most appealing attributes of the better games is the inclusion of digitized—instead of synthesized—sound effects. If a program uses digitized sounds, when a gun fires, you hear an explosion or when your opponent beats you, he may add to the humiliation with real laughter.

Perhaps the nicest thing about digitized sound effects is that they are super easy to accomplish. A sampling program, digitizing hardware and an input device (radio, tape recorder, VCR, microphone, etc.) are all you need. You can record any sound you can hear—just like you would if you were using a tape recorder. But instead of

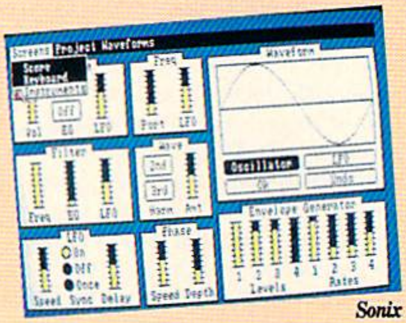
Continued on page 77



Keyboard Controlled Sequencer



Dynamic Studio



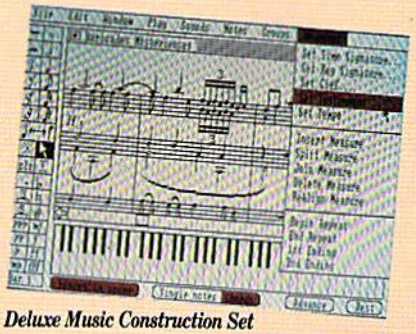
Sonix



MIDI Recording Studio



Synthia
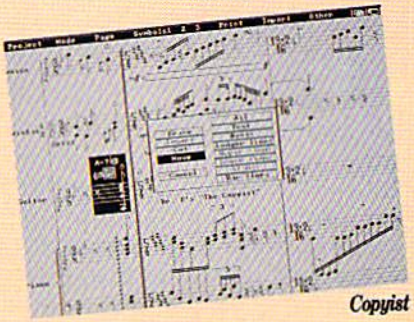


Deluxe Music Construction Set



MIDI Magic



Studio Magic



Copyist

BEST OF AMIGA PUBLIC DOMAIN

BY GRAHAM KINSEY

As the dog days of summer continue, many Amiga users find themselves with free time on their hands. This can mean only one thing: It's time for the second annual Amiga Public Domain Awards! So grab a chair and a glass of lemonade and relax in the shade as we announce the cream of this year's Amiga PD crop.

For those of you who weren't around last year, let me first briefly explain why I'm doing a "Best of" feature now, instead of the end of the year. Remember that there are lead times involved with writing for a monthly magazine. By writing this article now, I'm much closer to the end of a calendar year than if I wrote this article for a December release. Also, this a good time for such an article, since most people have summer vacation and some extra time to explore the wealth of PD programs available.

THE ENVELOPE, PLEASE...

Here are the best Amiga Public Domain programs from those reviewed in my monthly column here in *Commodore Magazine* from August 1988 through July 1989. For each Amiga PD category I bestow gold, silver and bronze medals to the top three programs in the category (yes, I know last year I promised to come up with something more original this time . . . so I lied!). In some categories I also give "honorable mention" awards to one or more programs that didn't make the top three, but still deserved to be commended.

Most of the software categories should be self-explanatory. The ANIM Animations category includes all animations that are saved using the IFF ANIM format. (In addition to *VideoScape 3D*, this includes animations created with *Animator: Apprentice, Turbo Silver, 3D Professional* and others.) The Miscellaneous Awards category represents programs that had no competition (i.e., they're in a class by themselves) yet still deserved special recognition. Programs nominated in this category *all* win gold medals, since it's like comparing apples and oranges, so to speak.

For most programs I have included either the Fish disk number that each program resides on (if this is the case), or the file number from the file libraries in PeopleLink's AmigaZone. Also please note that any of the programs mentioned can be obtained by writing to SMAUG (South Metro Amiga Users Group).

GAMES

Gold: Moria
by Bryan and Richard Henderson
(AmigaZone file #15421–2)

Last year's winner in this category, Larn, which was also a great Fantasy Role-Playing (FRP) game, was a joy to play. However, in terms of complexity, Larn is a mere shell compared to version 3.0 of Moria. Moria has more to offer in terms of magic items and monsters than any game I've ever seen—public domain or commercial! Moria adds so many twists to the puzzle that you won't ever think of it as just a hack-and-slash game.

Unlike the Hack series, Moria puts hunger and its solution into a proper perspective: You can die of hunger in Moria, but food is cheap, plentiful and relatively easy to find. After all, it wouldn't make sense to go on any adventure if you couldn't be certain about how you will take care of your next meal!

The two biggest complaints about Moria—lack of color graphics and play speed—have been solved, and version 3.0 really has no major drawbacks. Moria may only be a dungeon-based adventure, but I've seen wilderness adventure games that just can't keep your interest like Moria can.

Silver: Star Trek by Eric Gustafson

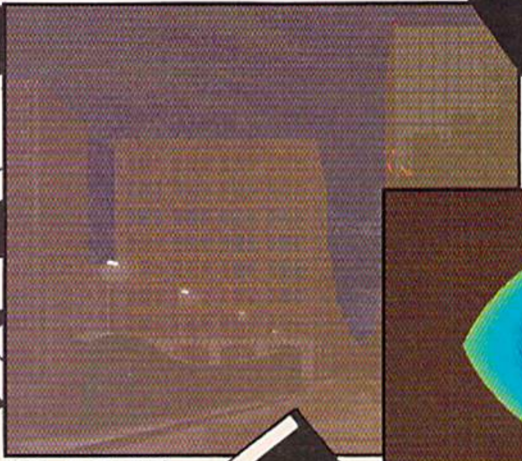
I had trouble deciding where to place this entry. Eric's Star Trek program *is* a game. However, it really should be considered on the same level as *Defender of the Crown*. While you can "play" it, its best attribute is in simply being able to dazzle your friends when they see the amazing



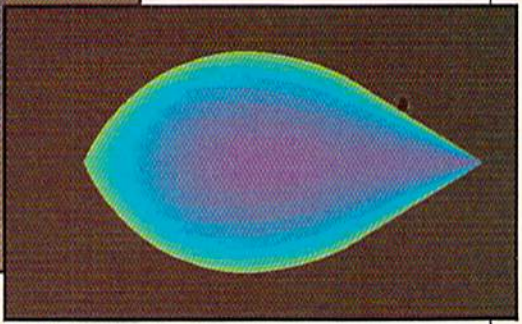
ED SAUK



Access!



Walker II: The Trailer



BezSurf

digitized graphics and sound effects from the *Star Trek* television series.

While Star Trek—unlike *Defender of the Crown*—won't be known for breaking new ground in the Amiga graphics arena, *Defender of the Crown* isn't exactly a household name in the U.S. and around the world either! It's great to blow away onlookers with the Amiga's graphics and sound capabilities, but it's even better when you can show them something that they can relate to.

This game is also great for showing what the average person can do with the Amiga. *The Director*'s language is on a par with BASIC as far as new users being able to learn and get results quickly. While Eric was the person who accomplished this masterpiece, unlike a commercial game (almost always written in assembly language), anybody who had *The Director,* a real-time digitizer (Eric used PerfectVision, but results from using FrameGrabber would have been even more amazing), some PD digitized samples (or an audio digitizer), and some free time *could* have done this! I can't think of a better example of the awesome power the Amiga can give to its owner.

Bronze: BattleFort by Ralph Reed
(AmigaZone file #12787; Shareware: $25)

This game was in the running to win an award last year but didn't quite make it. Formerly known as BattleMech, BattleFort's major addition is support of a one-player mode. In my mind this is the feature that wins an award for the program this time around.

For those who haven't seen any of the BattleMech/BattleFort versions so far, we're talking serious high-tech robotic combat here. While robotic combat is a big theme for Saturday morning cartoons, this is not a game for eight-year-olds. I wouldn't say this game is as complex as Moria, but it comes fairly close, especially once you have sent in the shareware fee and are able to build your own robots (and/or forts). For those who demand some eye- and ear-candy in their games, BattleFort's beautiful 16-color 640×400 hexagonal map and loud sound effects should satisfy most.

Honorable Mention: Sorry!
author unknown
(AmigaZone file #15299)

Have you been looking for a nice family game? Would you like to show off your Amiga to family members while being entertained at the same time? If so, look no further. Sorry! is the best Amiga PD version of any board game I've seen yet. It faithfully duplicates the board game (after all, the code was written by someone at Parker Brothers!).

The movement is very smooth and adds at least one feature to the game—the show all moves option—that isn't possible on the actual board version. Other than the numbers for the cards being smoothed out a bit (we're talking serious jaggies here) and maybe a sound effect or two, I can't think of anything that needs improvement. Now how about a C version of Monopoly?

Honorable Mention: Orbit3D
by Richard Horne
(AmigaZone file #13990; Shareware: $25)

This game can not only be played in three dimensions (using red–blue glasses), but it's also educational in that by playing the game you learn about gravity and how it plays a role in the creation, alteration and destruction of orbits. While you won't exactly be qualified to pilot the space shuttle after a few hours, a little extra understanding doesn't hurt, does it?

TERMINAL PROGRAMS

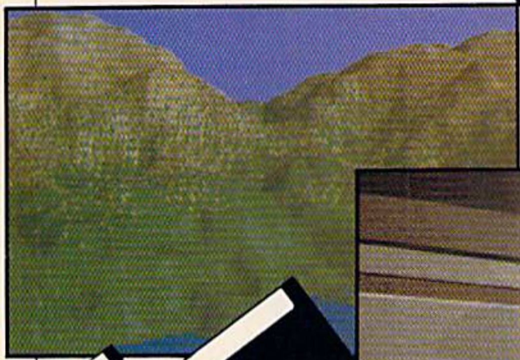
Gold: Access! by Keith Young

When AMICPDTERM and its author David Salas disappeared from the Amiga PD world (in search of commercial success), Keith Young's Access! quickly moved in to become the new king of the hill. Access! isn't known for its great protocol support, since even today it does not directly support Zmodem or Ymodem (AMICPDTERM at least supported Ymodem, although only in the form of XModem–1K which doesn't support batch transfers).

Access! first became famous for its superb color support, including shadow text and nicely rendered color gadgets. Of course, in the tele-community the effect of colors wears off quickly, so Access! needed to have more than just pretty colors. Keith responded with major feature additions, some expected by the telecommunicating community and some really novel and wonderful.

Autoredialing was added, and later came queue support (so you could select several numbers and Access! would dial one at a time, remove it from the list when you connected, and then later dial the remaining entries), which is essential when calling local BBS's.

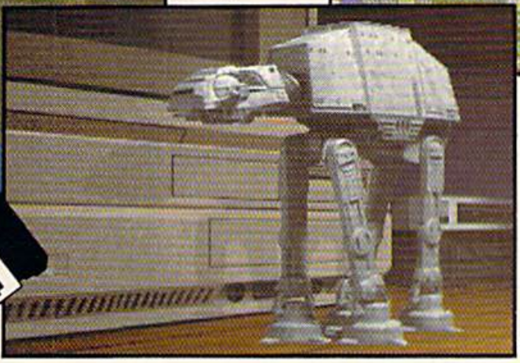
Multiple font support was added so that you could have two different fonts in a chat window, one for incoming text and a separate one for your text entry window.



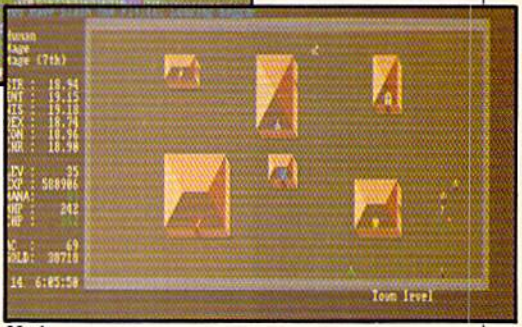
Scenery



BattleFort



Walker



Moria

The addition of Iconification made it easier to run Access! while performing other tasks at the same time.

Four-color support was finally allowed, so those who didn't care about Access!'s colors could just ignore them (while speeding up the program, not to mention saving CHIP memory).

The Reader program "rd" was a neat new feature that made it possible (as well as convenient and efficient) for you to read text files online from within Access!

While many terminal (and other) programs allow you to open a NewCLI via a menu option, Access! didn't force you to go back to the Workbench screen to find the NewCLI (this is one occasion where playing hide and seek is *not* fun).

Access! is also the only program I've ever heard of that fully supports Bill Hawes' great commercial shell program WSHell, via opening a NewWSH instead of a NewCLI if you use WSHell.

One of the last major feature additions was script support. While Access!'s script support isn't complete, it is the only PD terminal program with any decent level of script support (there are a bunch of Access! scripts online on PeopleLink's AmigaZone if you're interested).

While there haven't been any new versions of Access! in several months (and rumors persist that Keith Young may follow David Salas' lead and go commercial with Access!), the program as it stands is still very useful and will be actively used by many Amiga users for a long time to come.

Continued on page 81

THE AMIGA PD HALL OF FAME

As we enter the portal of the Amiga PD Hall of Fame, let's take a moment to recognize last year's inductees. Enshrined in this venerable institution (on these pages) one year ago were Eric Graham's Juggler demo as well as the ASDG-RRD (Recoverable RAM Device) by Perry Kivolowitz and ASDG, Inc. They will be joined this year by two more legendary programs.

It goes without saying that inductees must be great PD programs, but to qualify for this honor PD programs must meet two criteria. First the program must be a prime example of what the Amiga can do. In addition, the program will have single-handedly revealed important new features or possibilities to Amiga users.

Drum roll, please . . .

Communicator by Dan James (Fish 71)

This terminal program was not only a major success in itself, but has also fathered many other excellent Amiga PD programs via its source code. I still consider Communicator the PD terminal package of choice for new Amiga users.

It is a very easy program to learn and use, and is regarded as one the most bullet-proof Amiga PD programs in terms of susceptibility to the Guru. It doesn't support all the fancy features and sophisticated protocols of today's terminal programs, but once a new Amiga user is comfortable with the potentially confusing world of Amiga telecommunications, he/she can then move up from Communicator to a more powerful telecommunications package (before you can run you must learn how to walk).

Communicator's group of offspring grows every year. The oldest child of Communicator, AMICPDTERM, is now nearing commercial release, and its next oldest child, Access!, may also leave the PD nest and seek further fame and fortune in the commercial world. The latest progeny include ProtoComm, AZComm (mentioned elsewhere in this article) and the most recent arrival, CommPLX.

Communicator is a shining example of how everyone in the Amiga community can benefit when a talented Amiga PD programmer releases source code to help other Amiga programmers create new programming works of art.

DemoReel1 by NewTek, Inc.

The crew at N-N-N-NewTek were off to a great start when the first version of Digi-View was selling like hotcakes back in mid '87. Little did they realize that a PD demo released a few months later would do just as much to enhance their prestige (which today is unmatched even by Electronic Arts) as their hottest commercial product.

Those who read the '87 Amiga PD Awards may remember some of the reasons why I awarded DemoReel1 a gold medal (in the Custom Demos category), including the first glimpse of Digi-View's 640×400 color mode and *Digi-F/X* (which, in the current frenzy about when the Video Toaster be released seems to have been almost forgotten by many Amiga fanatics), plus the superb digitized soundtrack (which back in late '87 was rare for Amiga PD demos). However, those who have seen it over and over won't need me to justify this Hall of Fame entry.

As for DemoReel1's successor, we can only hope that DemoReel1 didn't make NewTek so famous that they are no longer motivated enough to bother with DemoReel2.

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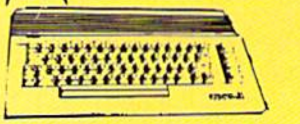
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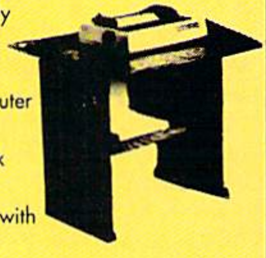
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by John Walker

Rainy Day Moon

for the Commodore 128

Explore celestial mechanics and the powerful graphics commands of BASIC 7.0 with this moon phase display program.

The ever-changing celestial ballet of sun, moon and planets has fascinated observers ever since the first proto-humans raised their eyes to the sky. The quest to understand, explain and predict the progression of the seasons, the phases of the moon and the paths of the planets has spurred the development of mathematics and science from the arithmetic of the Babylonians, through Newton's theory of universal gravitation, to Einstein's theory of general relativity.

Celestial mechanics—calculating the motions of heavenly bodies—is one of the most ancient fields of science, and today it's a dynamic and exciting area of research. Supercomputers are being applied to problems such as the evolution of galaxies, the behavior of asteroids and comets, and the long-term future of the solar system. Precise calculation of the positions of planets and moons is as essential a part of a *Voyager* mission as the rocket that bears it skyward.

Accurately calculating the motion of planets is a demanding task, and while the Commodore 128 is far from a supercomputer, your 128 places far more computing power in your hands than was available to Newton, Kepler or Einstein. This program sets your computer to work on a classic problem in celestial mechanics—calculating the phases of the moon. It turns your computer screen into a moon that never sets, a moon you can watch even when it's raining outside.

The Program

The moon calculator is written entirely in BASIC. Type in the program and save it on disk in a file named MOON. Then you can load and run the program with the commands:

```
DLOAD "MOON"
RUN
```

When you start the program, it asks you to enter the time, date and your time zone (including whether daylight savings



SARAH BOWEN

time is in effect). For example, if it's 2:45 p.m. on July 4, 1989, and you live in the Mountain time zone with daylight savings time, you would answer the questions as follows:

ENTER TIME AS HHMMSS: ? *144500*
ENTER DATE AS YYMMDD: ? *890704*

TIME ZONES:

	EASTERN	CENTRAL	MOUNTAIN	PACIFIC
STANDARD	5	6	7	8
DAYLIGHT	4	5	6	7

TIME ZONE: ? *6*

Be sure to enter the time using a 24-hour military-style clock; midnight is 000000, noon is 120000, and 11:30 p.m. is 233000. Also be careful to enter the date as specified:, year, month, then day. If you enter a year between 88 and 99, the year is between 1988 and 1999; if you specify a year less than 88, the year is after 2000. You don't have to enter the current date and time—if you'd like to see what the moon will look like on your 100th birthday, just enter the date and take a peek.

If you live in a time zone other than the mainland U.S. zones listed, answer the "TIME ZONE:" query with the number of hours to add to your local time to obtain Universal (Greenwich Mean) Time. If you don't want to enter the time zone every time you run the program, you can preset your time zone in the program by changing line 80 to set variable TZ to the correct time zone.

All About the Moon

After you enter the date and time, the screen clears and the program calculates the positions of the sun and moon and displays the results. Time and date appear at the top of the screen. Both local time and Universal (Greenwich Mean) Time are shown, as well as the Julian date and day of the week. Astronomers use Julian dates to calculate spans of time; the Julian date is simply the number of days since January 1, 4713, B.C. The decimal fraction after the Julian date is the fraction of a day elapsed at the current Universal Time.

A picture of the current phase of the moon fills the center of the screen. The moon is shown even if you can't see the real moon because it's below the horizon or too close to the sun in the sky. To the right of the moon, the distance to the moon appears in both kilometers and Earth radii, and the angle the moon subtends in the sky is given in degrees. Since the orbit of the moon is an ellipse, not a circle, these values change as time passes. The fraction of the moon illuminated by the sun is shown as a percentage of full: 0% indicates a new moon, 100% a full moon. Finally, the age of the moon gives the number of days, hours and minutes since the last new moon.

At the left of the screen, information about the sun is presented. The distance from the Earth to the sun is shown in kilometers and Astronomical Units (an Astronomical Unit is the average distance between the sun and the Earth: about 150 million kilometers or 93 million miles). The angle the sun subtends in the sky is also calculated. An eclipse of the sun is total only if the apparent size of the moon exceeds that of the sun during the eclipse; it's fascinating to watch the angular sizes change as the Earth and moon follow their orbits.

At the bottom of the screen, dates and times of current moon phases appear; these times are given in Universal Time to match most astronomical tables. Lunations count new Moons starting with lunation one on January 16, 1923.

As time passes, the display is updated about every five seconds. If you press the "F" key, the program races through time at the rate of 12 hours every five seconds. This lets you watch the moon go through its phases and get a feel for how the Earth and moon move in their orbits. Pressing any other key makes the program exit to BASIC.

Any calculation of real-world events must trade off accuracy against complexity and time to complete the calculation. The numbers shown for the moon and sun are generally accurate to within about ten minutes, and the times of phases shown at the bottom of the screen are quite accurate, generally differing only a minute

from astronomical tables.

After a steady diet of computer games, word processing or programming, having your computer calculate how the moon will look and then stepping outside and seeing the real moon in the sky, appearing just as the computer said it would, is a very different and palpably exciting experience. Many fascinating applications of computers involve simulating real-world events. When you run this program you're putting the sun, Earth and moon inside your Commodore 128 and watching them dance in a computer-simulated sky.

References and Resources

If this program has whetted your interest in celestial mechanics and astronomical computing, you'll find it a rich, rewarding and enjoyable area to explore on your own. The following books contain information and formulas you can use to write your own programs that calculate the positions of the planets, rising and setting times, orbits of comets, and even make your own predictions of eclipses.

Duffett-Smith, Peter. *Practical Astronomy With Your Calculator.* 2nd ed. Cambridge: Cambridge University Press, 1981.

Meeus, Jean. *Astronomical Formulae for Calculators.* 3rd ed. Richmond: Willmann-Bell, 1985.

Burgess, Eric. *Celestial BASIC.* Rev. ed. Berkeley: Sybex, 1985.

In addition, *Sky & Telescope* magazine has a monthly column, "Astronomical Computing" which often includes astronomically-oriented programs in BASIC.

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30008, Shreveport, LA 71130-0007, 1-800-831-2694.

Rainy Day Moon

```
20 REM   A MOON FOR THE C-128'BQTC
70 REM PRESET TIME ZONE IN NEXT
   LINE'BYCK
80 TZ=-1'CDJG
90 DIM PA(4):PA(4)=-1'DMVJ
100 ZF=0'BDEV
110 YB=2447119'BJJX
120 C=56328:REM CIA1 CLOCK BASE
    ADDRESS'CCFF
130 NM$="JANFEBMARAPRMAYJUNJULAUGSEPO
    CTNOVDEC"'BDNK
140 DIM WD$(6)'BGDA
150 WD$(0)="SUN":WD$(1)="MON"
    :WD$(2)="TUES"'DUTJ
160 WD$(3)="WEDNES":WD$(4)="THURS"
    :WD$(5)="FRI":WD$(6)="SATUR"'ECCP
170 W9=0:W6=-1000'DKLG
180 POKE C+7,PEEK(C+7) AND 127
    : REM SET CLOCK TIME'GXHM
190 POKE C+6,PEEK(C+6) AND 128
    : REM LINE FREQ = 60HZ'GYBN
200 INPUT "ENTER TIME AS HHMMSS
    : ";A$'BDCD
210 H=VAL(LEFT$(A$,2))'DJKA
220 M=VAL(MID$(A$,3,2))'DLGC
230 S=VAL(MID$(A$,5))'DJBC
240 IF H>23 OR M>59 OR S>59 THEN
    200'HMUH
250 E=H:IF E>11 THEN E=E+68'GKLH
260 POKE C+3,16*INT(E/10)+E-INT(E/10)
    *10'KSDM
270 POKE C+2,16*INT(M/10)+M-INT(M/10)
    *10'KSBN
280 POKE C+1,16*INT(S/10)+S-INT(S/10)
    *10'KSSO
290 POKE C,0 : REM TENTHS,
     START CLOCK'CVAL
300 REM  OBTAIN DATE'BKFA
310 INPUT "ENTER DATE AS YYMMDD
    : ";A$'BDTE
320 YY=VAL(LEFT$(A$,2))+1900'EOBE
330 IF YY<1988 THEN YY=YY+100'FNSG
340 MM=VAL(MID$(A$,3,2))'DMIF
350 DD=VAL(MID$(A$,5))'DKXG
360 IF MM<1 OR MM>12 OR DD<1 OR DD>31
    THEN 310'JRLN
370 IF TZ>-1 THEN 430'EGEI
380 PRINT "TIME ZONES:"'BALI
390 PRINT "[SPACE7]EASTERN CENTRAL
    MOUNTAIN PACIFIC"'BAGQ
400 PRINT "STANDARD[SPACE3]5[SPACE6]6
    [SPACE6]7[SPACE9]8"'BAHE
410 PRINT "DAYLIGHT[SPACE3]4[SPACE6]5
    [SPACE6]6[SPACE9]7"'BAIF
420 INPUT "TIME ZONE: ";TZ'BDQE
430 Z8=H:H1=H:M1=M:S1=S
    :GOSUB 1620'FUQJ
440 COLOR 0,7:COLOR 1,2:SCNCLR
    :COLOR 4,7'EMEI
450 GRAPHIC 1,1'BDHE
460 REM FUNCTION DEFINITIONS'BTXK
470 DEF FN R(X)=X*([PI]/180)'GKEL
480 DEF FN D(X)=X*(180/[PI])'GKPM
490 DEF FN F(X)=(X-360*(INT(X/360)))
    'HSFP
500 DEF FN S(X)=SIN(FN R(X))'FKCE
510 DEF FN C(X)=COS(FN R(X))'FKKF
520 DEF FN A(X)=ATN(X/SQR(1-X*X))'IMXJ
530 EO=0.016718 : MC=0.0549'CTJH
540 GOSUB 3580'BERE
550 REM    MAIN LOOP'BIMG
560 GOSUB 640'BDNG
570 GET A$:IF A$="" THEN 560'EIKK
580 IF A$="F" THEN ZF=1-ZF
    : GOTO 560'GLMN
590 GRAPHIC CLR : STOP'DBRK
610 REM APPLY UPDATES APPROPRIATE
    TO'BAVJ
620 REM THIS TIME.'BJKF
640 IF ZF THEN JF=JF+.5
    : GOTO 770'FMSK
650 C=56328'BGCG
660 H=PEEK(C+3):M=PEEK(C+2)
    :S=PEEK(C+1):T=PEEK(C)'LWHS
670 PM=1'BDCI
680 IF H>32 THEN H=H AND 127
    : PM=0'GMLO
690 H=INT(H/16)*10+H-INT(H/16)*16'JQWS
700 IF PM=0 AND H<12 THEN H=H+12'HKNI
710 IF PM=1 AND H=12 THEN H=0'GIGH
720 M=INT(M/16)*10+M-INT(M/16)*16'JQRM
730 S=INT(S/16)*10+S-INT(S/16)*16'JQQN
740 JF=(S+60*(M+60*H))/86400+(TZ/24)
    'IYYP
750 IF H<Z8 THEN JB=JB+1'FIYL
760 Z8=H'BDOI
770 JD=JB+JF'CGGL
780 D=JD'BDGK
790 GOSUB 1240'BEIL
800 COLOR 1,2'BDRD
```

```
810 CHAR 1,16,2,D$'BJYF
820 D=JD-(TZ/24)'DJOI
830 GOSUB 1240'BEIG
840 CHAR 1,16,1,D$'BJXI
850 D$=RIGHT$("00000"+MID$(STR$(INT
    (JF*100000)),2),5)'HWLR
860 D$=STR$(YB+INT(JD+0.5))
    +"."+D$'HPWQ
870 CHAR 1,15,3,D$'BJYL
880 D=INT(JD-TZ/24+0.5)+4'GNRR
890 D=D-7*INT(D/7)'FHUP
900 CHAR 1,16,4,WD$(D)+"DAY[SPACE3]
    "'CNKI
910 TD=JD'BEPF
920 GOSUB 2140'BEIG
930 COLOR 1,8'BDXH
940 CHAR 1,0,8,MID$(STR$(SD+0.5),
    2)+" KM"'FRTO
950 CHAR 1,0,9,MID$(STR$
    (SD/1.495985E8+10.0005)+"0000",3,
    5)+" A.U."'HIEV
960 CHAR 1,0,12,MID$(STR$(10.00005+SA)
    +"0000",3,6)+" DEG"'GAET
970 COLOR 1,16'BEUL
980 CHAR 1,30,15,MID$(STR$(INT(PH*100)
    ),2)+"% FULL[SPACE2]"'GVUV
990 D$=MID$(STR$(INT(MG)),2)+"D"'FMXS
1000 T=INT(24*(MG-INT(MG)))'FNVY
1010 D$=D$+STR$(T)+":"'EHVX
1020 D$=D$+RIGHT$("00"+MID$(STR$(M7),
     2),2)'GQSC
1030 IF MG<10 THEN D$=D$+" "'FIMB
1040 IF T<10 THEN D$=D$+" "'FHEB
1050 CHAR 1,30,18,D$'BKAA
1060 CHAR 1,30,8,MID$(STR$(INT(MD+0.5)
     ),2)+" KM"'GUUH
1070 CHAR 1,30,9,MID$(STR$
     (MD/6378.16+0.05)+"0000",2,
     4)+" E RAD"'HDYM
1080 CHAR 1,30,12,MID$(STR$
     (10.00005+MS)+"0000",3,
     6)+" DEG"'GBLM
1090 GOSUB 3330'BEKD
1100 IF JD<PA(4) THEN 1200'DLAX
1110 SD=JD'BEOV
1120 GOSUB 3100'BEFW
1130 COLOR 1,2'BDRX
1140 LU=INT(((PA(0)+7)+23683)
     /29.53058868)+1'GGFI
1150 D=PA(0):GOSUB 1370
     :CHAR 1,0,20,"NEW MOON
     :[SPACE2]"+D$+" LUNATION"+STR$
     (LU)'HAJO
1160 D=PA(1):GOSUB 1370
     :CHAR 1,0,21,"FIRST QTR
     : "+D$'EVRK
1170 D=PA(2):GOSUB 1370
     :CHAR 1,0,22,"FULL MOON
     : "+D$'EVAL
1180 D=PA(3):GOSUB 1370
     :CHAR 1,0,23,"LAST QTR
     :[SPACE2]"+D$'EVXL
1190 D=PA(4):GOSUB 1370
     :CHAR 1,0,24,"NEXT NEW
     :[SPACE2]"+D$+" LUNATION"+STR$
     (LU+1)'IBLT
1200 RETURN'BAQU
1220 REM EDIT JULIAN DATE TO CIVIL
     DATE'BAFE
1240 TD=D'BDQA
1250 GOSUB 1730'BEMB
1260 GOSUB 1920'BENC
1270 D$=RIGHT$(STR$(H8+100),2)+"
     :"'FNUI
1280 D$=D$+RIGHT$(STR$(M8+100),2)+"
     :"'GPSK
1290 D$=D$+RIGHT$(STR$(S8+100),
     2)+" "'GPWL
1300 D$=D$+RIGHT$("[SPACE2]"+STR$(D9),
     2)+" "'GMIC
1310 D$=D$+MID$(NM$,1+(M9-1)*3,3)'GTDE
1320 D$=D$+STR$(Y9)'DIKB
1330 RETURN'BAQY
1350 REM EDIT JULIAN DATE TO SHORT
     DATE'BAFI
1370 TD=D'BDQE
1380 GOSUB 1730'BEMF
1390 GOSUB 1920'BENG
1400 D$=RIGHT$(STR$(H8+100),2)+"
     :"'FNUD
1410 D$=D$+RIGHT$(STR$(M8+100),
     2)+" "'GPQF
1420 D$=D$+RIGHT$("[SPACE2]"+STR$(D9),
     2)+" "'GMIF
1430 D$=D$+MID$(NM$,1+(M9-1)*3,
     3)+" "'HTYI
1440 D$=D$+RIGHT$(STR$(100+Y9-100*INT
     (Y9/100)),2)'JARM
1450 RETURN'BAQC
1470 REM CONVERT DATE IN Y, M,
      AND D'BVVK
1480 REM TO JULIAN DATE IN J'BPSJ
1500 IF M>2 THEN M=M-3 :ELSE M=M+9
     :Y=Y-1'KNRI
1510 C=INT(Y/100)'DHUC
1520 Y=Y-(100*C)'DIXD
1530 J=D+INT((C*146097)/4)+INT(
     (Y*1461)/4)+INT((M*153+2)/5)'OJER
1540 J=J-726000'CIGF
1550 RETURN'BAQD
1570 REM CONVERT LOCAL DATE AND
     TIME'BXIM
1580 REM IN YY, MM, DD, AND H1, M1,
      S1'BWKM
1590 REM INTO ASTRONOMICAL JULIAN
     DATE'BBDP
1600 REM IN JD.'BFAA
1620 Y=YY:M=MM:D=DD'DLVG
1630 GOSUB 1500'BEHD
1640 JB=J-0.5'CGWF
1650 JF=(S1+60*(M1+60*H1))/86400+
     (TZ/24)'ICPP
1660 JD=JB+JF'CGGI
1670 RETURN'BAQG
1690 REM CONVERT JULIAN DATE IN
     TD'BVQO
1700 REM INTO Y9, M9, D9
     REPRESENTING'BYAH
1710 REM YEAR, MONTH, AND DAY.'BSYG
1730 J=INT(TD+0.5)'DIOG
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1740 J=J+726000'CIFH
1750 Y=INT(((4*J)-1)/146097.0)'FSEL
1760 J=(J*4.0)-(1.0+(146097.0*Y))'FXXN
1770 D=INT(J/4.0)'DHHK
1780 J=INT(((4.0*D)+3.0)/1461.0)'FUFP
1790 D=((4.0*D)+3.0)-(1461.0*J)'FVMQ
1800 D=INT((D+4.0)/4.0)'EMMG
1810 M=INT(((5.0*D)-3)/153.0)'FRVI
1820 D=(5.0*D)-(3.0+(153.0*M))'FUPK
1830 D=INT((D+5.0)/5.0)'EMOJ
1840 Y=(100.0*Y)+J'DKRJ
1850 IF M<10.0 THEN M=M+3 :ELSE M=M-9
     : Y=Y+1'KQJQ
1860 Y9=Y:M9=M:D9=D'DLJM
1870 RETURN'BAQI
1890 REM CONVERT JULIAN TIME IN
     TD'BVIQ
1900 REM INTO TIME IN H8, M8,
      AND S8'BVXI
1920 J=TD+0.5'CGIG
1930 IJ=(J-INT(J))*86400'ENLK
1940 H8=INT(IJ/3600)'DKOK
1950 M8=INT((IJ/60))-(H8*60)'FQSN
1960 S8=INT(IJ-(60*(M8+60*H8))+0.5)
     'HVAR
1970 RETURN'BAQJ
1990 REM SOLVE THE EQUATION OF
     KEPLER'BYHS
2010 REM INPUTS: M, E'BKFX
2020 REM OUTPUT: K'BIFY
2040 M=FN R(M)'CFWA
2050 E1=M'BDQA
2060 D1=E1-E*SIN(E1)-M'FKHF
2070 E1=E1-D1/(1-E*COS(E1))'GOOI
2080 IF ABS(D1)>1E-6 THEN 2060'FLAH
2090 K=E1'BDOE
2100 RETURN'BAQU
2120 REM CALCULATE MOON AND SUN
     INFO'BXYE
2140 D3=TD+2880.5 : REM DATE IN
     EPOCH'DWPG
2150 N=FN F((360/365.2422)*D3)'ETOG
2160 M3=FN F(N+(278.833540-282.596403)
     )'EDIJ
2170 M=M3 : E=EO : GOSUB 2040'DMIG
2180 EC=SQR((1+EO)/(1-EO))*TAN(K/2)
     'ISOM
2190 EC=2*FN D(ATN(EC))'EKKI
2200 LS=FN F(EC+282.596403)'DRUB
2210 F=((1+EO*COS(FN R(EC)))/(1-EO*EO)
     )'IWPH
2220 SD=1.495985E8/F'CNUC
2230 SA=F*0.533128'CLDC
2240 REM CALCULATE MOON'S
     POSITION'BXSH
2250 ML=FN F(13.1763966*D3+64.975464)
     'EBEJ
2260 M4=FN F(ML-0.1114041*D3-349.3830
     63)'FDNL
2270 MN=FN F(151.950429-0.0529539*D3)
     'EBOL
2280 EV=1.2739*SIN(FN R(2*(ML-LS)-M4))
     'HWTN
2290 AE=0.1858*SIN(FN R(M3))'EPOK
2300 A3=0.37*SIN(FN R(M3))'ENNC
2310 MP=M4+EV-AE-A3'EKAD
2320 ME=6.2886*SIN(FN R(MP))'EPHF
2330 A4=0.214*SIN(FN R(2*MP))'FPEG
2340 LP=ML+EV+ME-AE+A4'FMIH
2350 V=0.6583*SIN(FN R(2*(LP-LS)))
     'GTJK
2360 L4=LP+V'CFFF
2370 NP=MN-0.16*SIN(FN R(M3))'FPWK
2380 Y=SIN(FN R(L4-NP))*COS(5.145396)
     'GUIN
2390 X=COS(FN R(L4-NP))'EKQL
2400 IF X<>0 THEN 2440'EGGB
2410 IF Y=0 THEN LM=0 : GOTO 2450'FKRE
2420 IF Y>0 THEN LM=[PI]/2
     :ELSE LM=-[PI]/2'LJTK
2430 GOTO 2450'BEIC
2440 LM=ATN(Y/X)'DGLF
2450 LM=FN D(LM)+NP'DJBH
2460 MA=L4-LS'CGKH
2470 PH=(1-COS(FN R(MA)))/2'FNIL
2480 MD=(384401*(1-MC*MC))/(1+MC*COS
     (FN R(MP+ME)))'KGCT
2490 MF=MD/384401'CKHK
2500 MS=0.5181/MF'CKPC
2510 MG=29.53058868*(FN
     F(MA)/360)'EXAH
2520 M7=1440*(MG-INT(MG))
     :M7=INT(M7-60*INT(M7/60))'KEPO
2530 RETURN'BAQC
2550 REM CALCULATE MEAN PHASE OF
     MOON'BYYL
2560 REM FROM A STARTING DATE SD AND
     A'BXGM
2570 REM PHASE SELECTOR IN PH.
     RETURNS'BAPN
2580 REM MEAN PHASE IN MH.'BOWL
2600 TD=SD'BEYB
2610 GOSUB 1730'BEMC
2620 K=(Y9+((M9-1)*(1.0/12.0))-1900)
     *12.3685'HHQN
2630 T=(SD+32099)/36525'DPFI
2640 T2=T*T'CEOG
2650 T3=T2*T'CFPH
2660 K=INT(K)+PH'DGSJ
2670 UK=K'BDGI
2680 MH=-32098.24067+29.53058868*K+0.
     0001178*T2-0.000000155*T3'IYJX
2690 MH=MH+0.00033*FN S
     (166.56+132.87*T-0.009173*T2)
     'IMFW
2700 RETURN'BAQB
2720 REM CALCULATE TRUE,
      CORRECTED TIME'BCHL
2730 REM OF MOON PHASE GIVEN MEAN
     PHASE'BAQL
2740 REM TIME IN UK AND PHASE
     SELECTOR'BYDM
2750 REM IN PH.  RETURNS PHASE TIME
     IN'BXKN
2760 REM PT.'BDVI
2780 K=UK+PH'CFWL
2790 T=K/1236.85'CJAN
2800 T2=T*T'CEOE
2810 T3=T2*T'CFPF
2820 PT=-32098.24067+29.53058868*K+0.
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     0001178*T2-0.000000155*T3'IYYT
2830 PT=PT+0.00033*FN S
     (166.56+132.87*T-0.009173*T2)
     'IMKS
2840 M=359.2242+29.10535608*K-0.00003
     33*T2-0.00000347*T3'HTDT
2850 M1=306.0253+385.81691806*K+0.010
     7306*T2+0.00001236*T3'HVGV
2860 F=21.2964+390.67050646*K-0.00165
     28*T2-0.00000239*T3'HTNV
2870 IF (PH>0.01) AND (ABS(PH-0.5)
     >0.01) THEN 2960'HASS
2880 REM CORRECTIONS FOR NEW AND
     FULL'BYBR
2890 PT=PT+(0.1734-0.000393*T)*FN
     S(M)'GAFU
2900 PT=PT+0.0021*FN S(2*M)-0.4068*FN
     S(M1)+0.0161*FN S(2*M1)'MNIT
2910 PT=PT-0.0004*FN S(3*M1)
     +0.0104*FN S(2*F)-0.0051*FN
     S(M+M1)'NOFV
2920 PT=PT-0.0074*FN S(M-M1)
     +0.0004*FN S(2*F+M)-0.0004*FN
     S(2*F-M)'PPRX
2930 PT=PT-0.0006*FN S(2*F+M1)
     +0.0010*FN S(2*F-M1)+0.0005*FN
     S(M+2*M1)'QSQB
2940 RETURN'BAQH
2950 REM CORRECTIONS FOR QUARTER
     PHASES'BCSQ
2960 PT=PT+(0.1721-0.0004*T)*FN
     S(M)+0.0021*FN S(2*M)'KJYX
2970 PT=PT-0.6280*FN S(M1)+0.0089*FN
     S(2*M1)-0.0004*FN S(3*M1)'MORB
2980 PT=PT+0.0079*FN S(2*F)-0.0119*FN
     S(M+M1)-0.0047*FN S(M-M1)'NODD
2990 PT=PT+0.0003*FN S(2*F+M)
     -0.0004*FN S(2*F-M)-0.0006*FN
     S(2*F+M1)'QQTG
3000 PT=PT+0.0021*FN S(2*F-M1)
     +0.0003*FN S(M+2*M1)+0.0004*FN
     S(M-2*M1)'QSVP
3010 PT=PT-0.0003*FN S(2*M+M1)'GROE
3020 IF PH<0.5 THEN PT=PT+0.0028-0.00
     04*FN C(M)+0.0003*FN C(M1)
     :GOTO 3040'MQVN
3030 PT=PT+(-0.0028+0.0004*FN
     C(M)-0.0003*FN C(M1))'JITK
3040 RETURN'BAQY
3060 REM FIND PHASE TIMES
     SURROUNDING'BADJ
3070 REM THE CURRENT DATE,
      GIVEN IN SD.'BACJ
3080 REM LEAVES TIMES IN
     PA(0)-PA(4)'BYNJ
3100 AD=SD-45'CGAX
3110 S6=SD'BEJX
3120 SD=AD:PH=0'CIEB
3130 GOSUB 2600'BEJA
3140 U6=UK'BEUB
3150 AD=AD+29.53058868'CPTF
3160 M6=MH'BEBD
3170 SD=AD:PH=0'CIEG
3180 GOSUB 2600'BEJF
3190 IF (M6<=S6) AND (MH>S6) THEN
     3230'GQNM
3200 M6=MH'BEBX
3210 U6=UK'BEUY
3220 GOTO 3150'BEGA
3230 U7=UK'BEVB
3240 UK=U6:PH=0:GOSUB 2780
     :PA(0)=PT'EVCI
3250 UK=U6:PH=0.25:GOSUB 2780
     :PA(1)=PT'EYVK
3260 UK=U6:PH=0.5:GOSUB 2780
     :PA(2)=PT'EXWL
3270 UK=U6:PH=0.75:GOSUB 2780
     :PA(3)=PT'EYDM
3280 UK=U7:PH=0:GOSUB 2780
     :PA(4)=PT'EVHM
3290 RETURN'BAQG
3310 REM DRAW THE MOON AT AGE MA'BSXE
3330 CX=160:CY=100:XS=65:YS=50'EVBI
3340 T4=FN F(MA)/360'DKXG
3350 T1=INT(XS*COS(2*[PI]*T4))'HLEK
3360 IF T1=W6 AND T4>=W4 THEN
     RETURN'HISK
3370 COLOR 1,2'BDRG
3380 IF W6<>-1000 THEN CIRCLE 0,CX,CY,
     W5,YS,W7,W8'GACQ
3390 W6=T1:W4=T4'CJTK
3400 IF T4>=0.5 THEN 3490'EJCD
3410 IF W9=2 THEN CIRCLE 0,CX,CY,XS,
     YS,180,0'EWXI
3420 CIRCLE 1,CX,CY,XS,YS,0,180'BTNG
3430 W9=1'BDOD
3440 W7=0:W8=180'CJGG
3450 IF T1<0 THEN T1=-T1:W7=180
     :W8=0'HRPM
3460 CIRCLE 1,CX,CY,T1,YS,W7,W8'BTJK
3470 W5=T1'BETH
3480 RETURN'BAQH
3490 IF W9=1 THEN CIRCLE 0,CX,CY,XS,
     YS,0,180'EWWQ
3500 CIRCLE 1,CX,CY,XS,YS,180,0'BTNF
3510 W9=2'BDPC
3520 W7=180:W8=0'CJGF
3530 IF T1<0 THEN T1=-T1:W7=0
     :W8=180'HRPL
3540 GOTO 3460'BEKF
3560 REM PAINT STATIC SCREEN
     CONTENTS'BABO
3580 COLOR 1,2'BDRJ
3590 CHAR 1,0,1,"LOCAL TIME
     :[SPACE5]"'BGWO
3600 CHAR 1,0,2,"UNIVERSAL TIME
     : "'BGCH
3610 CHAR 1,0,3,"JULIAN DATE
     :[SPACE3]"'BGHH
3620 COLOR 1,8'BDXE
3630 CHAR 1,3,5,"SUN"'BGUG
3640 CHAR 1,1,7,"DISTANCE"'BGEJ
3650 CHAR 1,1,11,"SUBTENDS"'BHBK
3660 COLOR 1,16'BEUI
3670 CHAR 1,32,5,"MOON"'BHHL
3680 CHAR 1,32,14,"PHASE"'BIMM
3690 CHAR 1,33,17,"AGE"'BIAN
3700 CHAR 1,31,7,"DISTANCE"'BHFG
3710 CHAR 1,31,11,"SUBTENDS"'BICH
3720 RETURN'BAQE
```

END

Continued from page 53

things in life (art, literature and the theater).

Jermaine: What is the basic storyline of *Impossible Mission?*

Dennis Caswell: A mad scientist named Elvin Atombender is trying to crack the computer launch codes of missile systems around the world. Once this is accomplished, he can initiate an attack that will annihilate the planet. Your assignment consists of entering Elvin's underground installation, avoiding his army of robot guards, and breaking the computer's security code which will shut down the control center and end this terrible nightmare. All you have to work with are your wits, dexterity and a pocket computer that can be brought up on the screen. By the way, your enemy has the ability to carry out his plan in six hours, so work as fast as you can in the game.

Jermaine: How did you get involved in the project?

Caswell: I came to Epyx when the company acquired Starpath in November of '83. In the past, I created Atari 2600 titles like *Escape from the Mindmaster* and *Phaser Patrol,* but now I was ready to do something different. I wanted to produce a sophisticated action game, unlike anything on the market at that time. *Impossible Mission* was "inspired" (if I may so abuse the word) by the movie *War Games,* the difference being the existence of a crazed human villain who plans to blow up the world.

It took me ten months to complete the project. I did all of the programming, graphics and sounds, except for the speech synthesis (which was created by Electronic Speech Systems in Berkeley, CA). Credit also has to go to Craig Nelson, our head of product development, and to all the Epyx programmers who contributed ideas and helped playtest the beast. At one time or another, during the operation of the program, it uses all but 1¾K of the Commodore's 64K of RAM. It could have been made smaller, but the memory was there, so I used it. It's an unwritten law among programmers that any application, given sufficient time, will expand to fill all available memory.

Jermaine: Tell me more about *Impossible Mission.*

Caswell: The strategy of the game was really very simple: visit every room in the installation, search each piece of furniture, and gather as many puzzle pieces as possible. To save time, it's best to visit the rooms in order and search them completely before moving on. By using this approach, you don't have to keep track of the rooms that haven't been totally explored and where they are located in respect to your present position.

The room with seven little floorlets is the most challenging of the game. To get to the lift in the middle screen, the player has to learn to step—not leap—over the gaps in the floor. As you have probably discovered, there's no way to get to the lift by somersaulting over the opening. But by walking over to the edge of a gap, it's actually possible to step across the opening. Be sure you hold the joystick to the right (or to the left, if you're going to the left) until the figure has made it to the other side of the hole. If you release the stick before your stride has been completed, the figure on the screen will fall to his death—screaming all the way down. It also pays to make sure your toes are not sticking out over the edge of the gap before you take your stride. If they do, you'll slip and fall. This technique must be used in a couple of rooms and can be used in several others.

> "It's an unwritten law among programmers that any application, given sufficient time, will expand to fill all available memory."
>
> —Caswell

Each chamber also contains a number of robot security guards. It's interesting to note that their behavior patterns are randomly assigned at the beginning of every game. So each room contains the same number of robots, located in the same positions, but they always react differently to your presence. *Impossible Mission* features approximately 90 of these patterns, displaying various combinations of a few capabilities.

Some of the robots are fast; some are slow. Some of them can see you when you appear in front of them, at which point they might charge you, fire an electrical charge, or some combination of the two. Some robots can actually hear you, while others sense your presence and move towards your location whether they see you or not. Still others cannot react to your presence and simply follow a pre-determined pattern of movement. The trick here is to learn to recognize the various patterns of behavior and adjust your strategy accordingly.

We also had some ideas for the game that didn't appear in the final product. At one time, I considered making it possible for the user to reprogram the robots to help him in his quest. This initially sounded like a great idea, but time and memory grew short, and the program was complicated enough already. We even talked about having a game behind the control room door, instead of the cartoon that appears there now. But once again, time and memory came into play.

Jermaine: The program contains a number of puzzles to solve. What is the best way to deal with this element of the game?

Caswell: Puzzles tend to be tough, so let me explain a few things that might help you understand them better. First of all, the program generates visual puzzles from a library of 240 different pieces (which works out to 560 possible puzzles).

Each puzzle has four parts. Smart players will use their pocket computer to flip and turn pieces several different ways. Then it's wise to pick up a particular item and scan through all the others until you find one that goes together with it. Continue working with these pieces until you discover a third and fourth piece that complete the geometric figure. Another way to find a mate for a piece is to concentrate on one corner of the piece, and try to find another one that connects to that particular corner. By using this approach, the player narrows down the number of pieces that might fit together to form the figure.

Completing nine of these puzzles will give you the security code. Then it's a simple matter to locate the control center, push the joystick forward (to open the door), and the game is officially over. If you think you're an excellent player of the game, I challenge you to beat my personal record. I completed *Impossible Mission* in about 45 minutes, scoring 29,000 points.

Jermaine: Was *Impossible Mission* a big seller?

Caswell: The program sold very well, and its sequel hit the market in 1988. By the way, some of the tips mentioned above can also be used when playing *Impossible Mission II.*

The Fastload cartridge caused a near-revolution when it shipped in 1984/85. Brothers Craig and Scott Nelson, who were commuting to Epyx at the time, designed the system in their car on the way to work. Then Scott made it work on a cartridge and that was that. Both brothers still work at the company.

Pitstop, one of the top-selling computer games of 1983, was the brainchild of Michael Katz (formerly president Epyx). A year later, Steve Landrum and Michael Kasaka were co-developing Pitstop II. *Landrum went on to work on other projects including the* Temple of Apshai Trilogy, Super Cycle *and the* Vorpal Utility Kit. *He also developed* Skate or Die *for Electronic Arts (with Michael Kosaka). Michael, the first resident artist, made Epyx graphics the talk of the industry. I recently spoke to these talented individuals and asked them about that phase of their careers.*

Jermaine: Tell me about the making of *Pitstop II.*

Steve Landrum: In the beginning, an outside company worked with us on the project. The submissions they sent us were pretty bad, so I roughed up some game code to show them what we expected to see. Their work continued to be unacceptable, so I started the game over again. Even though half of the time allotted for the project was up before I started, I still got the product out on time.

I made an interesting discovery as I worked on some code to create a split screen with separate scrolling regions. If you activate both the extended-color mode and the multi-color mode at the same time (on the 64), the screen goes completely black. I used that effect in *Pitstop II,* whenever you entered or exited the pit. It allowed me to redraw the entire screen and not make it visible to the user.

Jermaine: How did you get involved in the *Super Cycle* project?

Landrum: We chose to write the program because *Pitstop I* and *II* had sold very well, and we wanted to generate a follow-up product that looked a bit different. Motorcycles were the perfect vehicles for the game. They're more exciting to ride than automobiles, open to the elements, and definitely more dangerous to operate. I also wanted to convince the player he was really moving fast on the roadway. Whether you know it or not, I worked very hard to make that element stand out above the rest.

When I started designing and programming *Super Cycle,* I took the display code from *Pitstop II,* cleaned it up and rewrote it to be more streamlined. Then I took out sections and wrote new code to handle the different display needs of the program.

The game control code is all new code. The main similarity between *Pitstop II* and *Super Cycle* is in the appearance of the road. By the way, we thought about putting various types of vehicles on the road with your cycle. But that idea didn't pan out.

Michael Kosaka, who was nicknamed "the sock," designed the beautiful backgrounds that appear in the game. There's an interesting story about the San Francisco track. It went out over the water to make Michael's graphics of the city look right. After examining the positions of the local landmarks in the picture, it made sense for the cycle to be somewhere over the San Francisco Bay.

Here are some tips for playing *Super Cycle.* The optimum shift point is around 9000 rpm. Learn what the motor sounds like at 9000 rpm, so you can shift without having to look at the screen. When traveling at a high rate of speed, downshifting reduces your speed much faster than applying the brakes. In case you're interested, my best *Super Cycle* score is over 320,000 points on level three.

Jermaine: What is the *Vorpal Utility Kit* and how does it work?

Landrum: The *Vorpal Utility Kit* was really Scott Nelson's project, but I helped him finish it up and get it out the door. Basically, it's a special [Commodore] 64 disk utility package that permits you to load things in a lot faster (about 25 times faster than normal).

This technology first appeared in the Fastload cartridge. When that product sold well, we decided to take things a step further. We created a program that allowed the consumer to write fast disk loaders for BASIC programs.

The word *vorpal* has an interesting origin. I believe it first appeared in "Jabberwocky," a poem by Lewis Caroll. In Dungeons & Dragons, you sometimes see a reference to the vorpal blade (which is a mighty sword). As a program, a vorpal utility is something very powerful.

Jermaine: You haven't said anything, Michael. What do you remember about working for Epyx?

Michael Kosaka: First of all, I was at the company from 1984-87, doing artwork for projects like *Summer Games, Pitstop II, World Games* and *Super Cycle.*

Several years ago, Scott Nelson and I pulled off the joke of the decade. Back then, Scott looked like the typical programmer: he had long hair, a beard and mustache, and dressed like a hippie. One day, a new Scott Nelson stepped through the doors of Epyx. Scott had to get glasses, so he decided to change his image. He got his hair cut short, shaved off the beard and mustache, and dressed in nice clothing. I mean he really looked like a stockbroker in that outfit. I didn't recognize him at first. So I thought it might be fun to take him around the company, introduce him as Scott's brother Max (who didn't exist), and see what happened. We fooled practically everyone, from the programmers and designers to the heads of the company. Scott's friends were actually shaking his hand and asking if he planned to get a job at Epyx. Scott would give them this serious look and say he was thinking about it. Some people didn't appreciate our prank, but it was terribly amusing at the time.

Epyx also had a policy of charging you a dollar if you were late for a company meeting. After a while, someone broke into the president's office and turned back all of his clocks (so they wouldn't be late all the time). I won't tell you who this person was, but he had a good reason for always being late.

I had a lot of fun with Steve and the guys back then, but they really took me to the cleaners at cards. Most of our programmers are hard-core mathematicians, and they knew all the card games inside and out. So I was constantly going broke in games where cards and numbers came into play.

Jermaine: Can you tell me about other projects you worked on?

Kosaka: Steve had problems when it came to constructing *The Temple of Apshai Trilogy.* As he examined the codes of these early games, there was a lot of material that needed a major facelift. After all, *Temple of Apshai* appeared on the market a long time ago. Technology has really changed since then, so much of the program was rewritten from scratch.

Speaking of Steve Landrum, he's a great guy to work with. Steve is a smart individual who knows how to manipulate code very quickly. Believe it or not, he once looked over a programmer's shoulder and located a bug in less than a minute. The other guy was about to pull his hair out, so Steve examined his work and said, "There it is." Then he fixed it for the guy. That's the kind of person Steve is.

Landrum: I really enjoyed working with Michael at Epyx and Electronic Arts (in recent years). He has a way of making microcomputer artwork look almost like a photo of the real thing. Michael also initiated the idea to hire a staff of artists at Epyx. That move made the programmers' job a lot easier. And our graphics are state-of-the-art. Everyone misses Michael around here, but I still see him every now and then.

As I said before, last year I wrote a tribute to the Epyx Games *line of products. At the time,* The Games: Summer Edition *wasn't far enough along to do much with it. Now you'll hear from the people who made the program and how it came together. My guests include: Peter Englebrite (project manager), Susie Green (graphic artist), and Joe Miller (vice-president, software development).*

Jermaine: How did you get *The Games: Summer Edition* off the ground?

Peter Englebrite: It started in January of 1988, with the 64 and IBM versions of the product coming out before the Summer Olympics that were held in September. We finished every event that was actually started. Some of our ideas that didn't work out included the long jump, high jump, 4×440 meter relay, certain swimming events and water polo.

We developed some contests and discarded others for several different reasons. First of all, we looked for events that could be made into good playable games. Then we tried to fulfill the fantasies of our followers. What would they like to compete in? It appeared that several records might be broken at the Summer Olympics, so we focused our attention on those particular events. Lastly, we wanted to put our players in the shoes of the athletes, as much as possible. Making a good computer game was one thing. Convincing the user that he was actually participating in the Olympics was another matter altogether.

Jermaine: The opening ceremony doesn't feature the lighting of the Olympic flame. Why did you depart from this traditional *Games* opening sequence?

Englebrite: We don't have much competition from other companies in this field, so we are constantly competing against ourselves. Each new product must be progressively better than the last one and not just a thinly disguised sequel of something we've already done. Everyone felt it was time to produce a new opening for the game, so the torch was moved over to the menu screen. I really got excited when they broadcast the Olympics on television. They were using the graphics of an Olympic torch, flying around square icons of the various events just like we did in the menu screen.

Jermaine: How did you make the events for the program?

Englebrite: There was a lot to learn about velodrome cycling. We sent our people down to the San Jose track, and they returned with information about the "cat and mouse" game cyclists play. It's basically a matter of knowing how to pace yourself and when to make your move. They also discovered that the "ringing of the bell" announced the final lap. So there was more to riding a bicycle than anyone ever imagined.

The uneven parallel bars gave us a number of headaches. I had a lot of trouble finding books on the subject that explained things on an Olympic level, instead of for amateur gymnasts. One of our people finally located the book we needed, complete with illustrations. But that's where the work really began.

> "Each new product must be progressively better than the last one and not just a thinly disguised sequel of something we've already done." —Englebrite

While all of this was going on, Cheryl Knowles (our art director) brought her little girl Shannon to the office one day. We took a look at her "monkey-on-a-stick" toy and used it to generate ideas for the game. First there were stick figures performing the different routines on the screen. Then our artists dressed things up and added all of the colorful details. It was also quite a challenge to put together routines in a set pattern, where the end of one sequence had to match perfectly with the beginning of the next.

The number of possible moves in the event staggers the imagination. We used 32 sequences in the game, containing about 300 frames of animation and 2100 Commodore 64 sprites. Now that's a lot of stuff, but it only represents a small portion of the things a real gymnast can do. If you want to impress your friends, with a perfect "10" performance on the "bars," follow these instructions to the letter: six downs, up, down, up, down, down, up, up, down, up, down, four ups, down and up.

Archery looks complex, but it was one of the easier events to make. In fact, it looks more like the standard shoot-'em-up arcade game than a "take aim and fire"-type of challenge. We thought the game needed more depth, so wind was added to mess up your aim a bit.

Jermaine: How did you research the artwork for *The Games: Summer Edition?*

Susie Green: I think I can explain things by telling you about the hammer throw game. Initially, when they gave me the job, I didn't know anything about the event. For starters, we went to the library and collected as much reference material as possible. This consisted of magazine articles, a rule book and step-by-step photos of hammer throwers in action. Unfortunately, no one could locate a videotape on the subject. We even went over to Stanford University looking for someone who might demonstrate the sport. Their hammer throwers weren't practicing because it was the wrong time of the year. So we didn't get any help from them. But I did get some people to model for me as the project came together.

Going back to the rule book, I finally figured out how to construct the event. It started out with one screen displaying a hammer thrower going through his warm-up exercises. As the athlete finally went into his routine, there came a time when he released the hammer. It soon became apparent that I couldn't show everything on a single screen. There just wasn't enough space. We could have done things with a scrolling approach, but it's been used too many times in the past. In the end, we solved this problem by giving the player a bird's-eye view of the hammer coming towards him (the moment it was released). By the way, I worked closely with the programmers throughout the project. I was always making sure that this thing and that thing could actually be done on the computer.

Jermaine: Did you think about doing some swimming events in the game?

Joe Miller: Yes, we talked about it in the early design sessions. Someone thought it might be fun to develop an underwater view of a swimming event. That concept sounded great at the time, but we gradually lost interest in it.

Jermaine: What else can you tell me about the project?

Miller: *The Games: Summer Edition* has done very well on the market. It was also our most massive project to date. Approximately 17 programmers, eight artists, two musicians and five technical writers worked many hours to produce three different versions of the same game at the same time.

When push came to shove, everyone made personal sacrifices. Peter asked Kevin to stay over late one night. Later it was revealed that he had already put in 40 hours straight. As *The Games: Summer Edition* drew to a close, Peter discovered that a scene from the closing ceremonies was missing. So rather than leave it out, he stayed up 20 hours and got the job

done. Looking back on the project, it really makes me proud to think I was a member of this team. They did fantastic work.

I saved the best for last. It's time to hear from the people who take care of business at the company. We have Gilbert Freeman (president of Epyx), Karen Janowski (vice-president, marketing consumer software), and Bob Lindsey (director, creative development). These individuals can tell us about their work abroad and possibly reveal a secret or two about upcoming products.

Jermaine: How long have you been selling software abroad?

Gilbert Freeman: In 1984, CBS was very active in the software business. They had offices throughout Europe. We signed a master contract with them to distribute our products in some of those countries. Initially we wanted to ship our programs to Germany, Spain, and the UK. But this agreement broadened to include Scandinavia, France, etc.

This agreement worked out well until CBS decided they wanted to get out of the business and didn't tell us about it. All of a sudden, some of our products were no longer being marketed, so we looked for new licensees in the region. By 1985, we had organized a new system where a distributor took care of things in each target nation. We had U.S. Gold in England, our former CBS affiliate took care of France, there were licensees in every Scandinavian country, and so on.

This arrangement quickly became a nightmare because each company was competing against their counterparts in other countries. If U.S. Gold got a product first, for example, they shipped it all over (even to the countries that already had distributors). It became almost impossible to manage this job, and they wouldn't work together for any reason. Something had to be done.

Two years ago, we signed a master contract with U.S. Gold, who now manages all of our affairs in Europe. They have exclusive distributors in every country, and everyone gets product at the same time.

Impossible Mission sold well in the states, but it was a megahit in Europe. *Impossible Mission II* has been a good seller both here and abroad. We weren't allowed to market *Sub Battle Simulator* in Germany at all. They will not publish or sell any military games in that country.

Incidentally, our software is now written in English, French, Spanish, Italian, German and Japanese. Epyx also imported the 500XJ Joystick from Konix (in Europe), where it was the number one joystick. Its sales are in six figures as we speak.

Jermaine: Dealing with people of different cultures must be interesting. Have you had any unusual experiences?

Karen Janowski: First of all, they spell things differently "over there." They put *-our* on the end of words like *color,* for example. So you don't always know what they're talking about in their letters, proposals and manuals. (Just kidding.)

> "Everyone also wants his product to be the best-selling item on the market. It can't be good; it has to be absolutely fantastic."
> —Lindsey

Last September, we attended a big trade show in London. It was too late to purchase space on the floor, so we ended up having our offices in a bus. Yes, Epyx rented an old double-decker bus, which was actually parked inside the building on the show floor. We met all kinds of developers there and negotiated some incredible deals in that environment. Unfortunately, you couldn't stand upright on the main floor of the vehicle, so people scrambled for space on the stairwell and the second story. Believe it or not, we even conducted business standing outside the bus. It was a very unusual situation—but a lot of fun.

Then you have to deal with the time here verses the time over there. I've called individuals at 6:30–7:00 a.m. to catch them as they end their work day.

Bob Lindsey: Not long ago, I tried to reach my contact at the company in the UK that developed *Tower Toppler.* We had some unfinished business to discuss. Anyway, I couldn't catch the guy at his home and he wasn't in the office either, so I called him up on his car phone. Here we were, conducting business as usual, while the other guy raced around the streets of London at 11:00 p.m. I guess I didn't distract him too much or I probably would have heard about it, if you know what I mean.

Freeman: The Europeans have their own special breed of software development problems. One programmer, who I believe was working on *Battleship,* suddenly disappeared off the face of the earth. We couldn't contact him at all. Epyx finally got through to his parent company. They said oh, he's just been drafted into the Finnish Army. This meant the guy could only work on the project every third or fourth weekend.

Then you have the lost development team in Budapest, Hungary. You just can't get there, by phone or aircraft. I honestly believe there are a dozen phones in that country; half are always busy and the other half are broken.

All kidding aside, it's hard to deal with a party 8000 miles away when your only communications are done by fax, telex, modem and direct phone calls. You never get to know the other people very well. It's kind of a shame.

Jermaine: Earlier we talked about *The Games: Summer Edition* (the latest *Games* project). Can you give me some information about the next *Games* program?

Janowski: We're working on a sequel to *California Games.* It may be called "Cal Games II," but that decision hasn't been made yet.

Here is a sneak preview of some of the sports we're currently concentrating on. First of all, a new type of skateboarding game is presently on the drawing board. You may not know this, but water is moved around southern California through a large system of aqueducts. These open-air pipes that can be ten feet tall are a skateboarder's dream. To do the job right, we're working closely with the Team Riders, a hot group of skateboarders in Santa Cruz.

Another big event is boogie boarding. Kids like to take these small boards out, flop on their stomachs and bodysurf back to shore. I've actually seen them do "barrel rolls" in the curl of a wave. This is really exciting stuff. I'm sure it will look great on the computer.

Snow boarding will also be coming your way. If you like to ride the waves at Malibu, imagine what it's like to surf downhill on a layer of snow. Yes, snow boarding is a hot new sport, where the user masters elements of surfing and skiing at the same time. He also performs a number of stunts, as he tries to keep from losing it on the course. I can hardly wait to play this game. It sounds like a lot of fun. "Cal Games II," or whatever we call it, features accurate simulations of each of these sports. I use the word *accurate* because we are working with experts in each of these fields. This product will be released on the 64 later this year.

Jermaine: Why do you think your employees are so special?

Lindsey: What can I say? They've added new meaning to the word *dedication.* Joe Miller discussed the dedication of the in-house staff earlier, but a few other examples come to mind. Several years ago, we saw an early version of *The World's Greatest Football Game* at a trade show in San Francisco. Epyx quickly negotiated a deal with Nexa, which was run by a man named Gilman Louie. It's interesting to note that Louie and his people went on to form Spectrum HoloByte, and he's still their president today. Anyway, their program needed a lot of work, but we went ahead and signed the contract telling them it had to be done by a certain date. Gilman said, "Look, I'm committed to you now. We'll move heaven and earth to get it out on time." I thought oh no, another one of those deals. Here we go again!

As we approached the due date for the project, Gilman and his group literally moved into Epyx (while we were still located at Sunnyvale, California). I'd come in in the mornings, and the guys would be hard at work or sacked out on the floor. And we didn't have heavy carpeting on the floor at that time. We also saw them working on the game when we left the office to go home at night. Those guys were absolutely incredible and worked on the project for many weeks. Epyx didn't need security people for a while because Louie and his group were always on the job. Now that's dedication! By the way, *The World's Greatest Football Game* was released on schedule.

On another occasion, we worked closely with K-Byte (a group based in Detroit) to produce our *World Games* program. I remember calling their president and saying, "We're going to miss the window, Pat. *World Games* won't be ready for Christmas release." These people also believed there's a time for work and a time for play. So they decided to put all their vacations on hold. They worked a three-day holiday weekend and continued putting the program together seven days a week, approximately 18 hours a day, during the final month of production. In the end, *World Games* did very well selling between 4–500,000 units worldwide.

This brings us to the story of how *Sub Battle Simulator* came to the market. Gordon Walton, leader of the Digital Illusions development team, gave us a demonstration of their realistic submarine program. And we said, "Gordon, this looks great! We'll take it."

Now Epyx had never done a simulation before, so we really didn't know what we were getting ourselves into. Simulations must be carefully researched, extremely accurate and patterned after the real thing. Testing these programs is also very difficult. In fact, I believe we budgeted several hundred hours of playtesting for the project. When all was said and done, they had tested the product for 900 hours and still weren't making much progress.

So I called Gordon in Texas and said, "It just isn't happening. We have to try something different. Why don't you and your people fly out to California, bring along your equipment, and complete the project here? We'll find you a place to stay." So Gordon took my advice, and we put them up in a nearby motel. Before they arrived, however, I rented them a trailer to work in and set it up in the large deserted warehouse next door. Gordon and his people worked in these surroundings day and night, for several weeks.

> "It takes a special breed of people to care this much about their job. It's our secret weapon against the competition." —Freeman

Now Epyx is located on an inlet near San Francisco Bay, and there are a lot of ducks and geese around here. So it didn't surprise anyone when white splotches appeared on Gordon's boxes. But the team kept going around the clock. A short time later, they purchased a small swimming pool, so the ducks had a place to swim in the warehouse. Then they bought food for their fine feathered friends. Before long, these guys had attracted a whole gaggle of geese and ducks to the building. It was beginning to look like a wildlife refuge.

In the end, Walton and his people completed their task and had a good time doing it. We, on the other hand, learned a lot more about the development cycle of simulation software. Incidentally, *Sub Battle Simulator* was a very profitable venture for us.

These stories have one thing in common. They're about dedicated people who don't have a "nine-to-five" job. These talented individuals gave us their all, and were reasonably compensated for their effort. But there is more to it than that. We're one big happy family around here. Our people work together, play together and have a lot of fun together. Everyone also wants his product to be the best-selling item on the market. It can't be good; it has to be absolutely fantastic. And that's the way it is.

Freeman: I feel like the head doctor at the local asylum. We have some real crazies around here, but I'm proud of every one of them. When we were shipping *California Games,* for example, people offered to work extra hours on the line to get the product boxed and out the door. It takes a special breed of people to care this much about their job. It's our secret weapon against the competition.

Lindsey: Gil forgot to tell you that employees with different jobs at the company worked side by side on the production line. Even Gil was there, and he wasn't giving orders. The president of the company was boxing software like everybody else. Pizza was brought in for supper, and everyone had a good time. As long as we keep this team spirit alive, the company will go on to celebrate its twentieth anniversary. I hope I'm here when it happens.

Commodore Magazine *would like to thank Noreen Lovoi, Epyx's Public Relations Manager, for her assistance in putting together this feature.*

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use both types and would be a fool to say such. But for most computing needs, what one computer does, the other can too, even if it does it a little differently.

Overall, though, I thought your article was very good and really served its purpose teaching Commodore users about MS-DOS.

Sincerely,
Bill Wolff
Chicago, IL

Piracy P.S.

To Gary Fields:

I read with great concern your article "Those Generous Pirates" (April 1989). Although I don't disagree with most of the article, I for one fall into the identifying pirate description—but with one exception, *I don't pirate software.*

Although I have several of the archival programs, I use them only for making backups of my precious and *expensive* programs. Being at least several weeks away (by mail) from the nearest software developer, common sense tells me not to abide by the no-backup laws.

I also am a member of the local Commodore user's group, one which I founded and help run to this day. And we do not condone, nor do we promote piracy. In fact, we discourage it as much as possible. I know we have lost a lot of members this way but it's better than losing our integrity.

I agree that software is expensive and that we are sometimes burned by the developers (especially when they show screen shots from the Amiga or Atari version on the back of the 64 box and don't tell you), but there is an alternative. Support the developers that sell un-copy-protected software like Batteries Included's *Paperclip III* or Interplay's *Neuromancer* with their code wheel. Or better still use shareware or public domain software.

There is one way developers can help themselves and us. That is to put out demo disks, like Electronic Arts with their interactive demo of *Demon Stalkers*, or Broderbund's Amiga demo of *Fantavision* (which is free to copy to all user group members). This is one way of stopping that "burned feeling" and promoting good software and public relations. If more developers did this, there would be more software sold, cheaper prices, less copy protection and more trust all around.

Sincerely,
Francis W. Murphy, Editor
Midland Commodore User Group
Victoria Harbor, Ontario, Canada

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while passing a slow mom-and-pop station wagon may seem the order of the day, keep in mind that the head-on traffic is equally dangerous, especially on mountain roads, where you can't always see what lies around the next corner. Crash and you will lose one of your five lives; make it to a gas station (which signals the end of a leg) and you will get one of those lives added back into your total.

If fallen rocks, possible rear end and head-on collisions, and treacherous curves weren't enough, there's always the highway patrol to contend with. You'll often know about the police well before you actually spot them, however, for your radar detector will begin to flash. You can then make a decision to either slow down to the legal speed limit (and watch idly as your competition speeds off into the sunset), or attempt to outrun the law. If you are extremely good and have a few miles of relatively flat highway, and if you have little or no traffic in your way, then maybe you can outrun the police. Since your computer opponent will also get stopped occasionally, it's often better to pull over and take your medicine (in the form of a speeding ticket and time penalty). If you are lucky, you may find that the smoky on your tail is actually after your computer opponent!

If you get bored flitting about in the Porsche or Ferrari included on the master disk, you may want to consider investing in *The Supercars.* This companion disk lists the performance and vehicle specifics of five additional sports cars. The Lotus Turbo Esprit is a British boy-toy sporting over 228 horses under the hood. Then there's the Ferrari Testarossa, with 12 smooth-hitting cylinders. Don't pass up a chance to jump into a Porsche 911 RUF, perhaps the best all-out sports car ever engineered, capable of speeds up to 211 mph. Lastly, there are the Lamborghini Countach and the Corvette ZR1, two legendary speeders, both renowned for their handling and asphalt-burning acceleration.

Test Drive II is everything that the original *Test Drive* wasn't. Now, with the companion disks available, there's scenery, seven cars to choose from, and head-to-head competition. Are you tired of watching the races from the grandstands, or—even worse—above and slightly behind the top of a car made up of chunky sprites? Then slip into the sleek cockpit of a Ferrari F40. But take heed: Afterwards, you may not want to climb back into that old station wagon in the driveway.

**64 and MS-DOS versions also available.*

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you paint, the brush plays your animation as you move it around and stamps each of the 30 images onto the screen. If you press the left AMIGA key while you paint, the program automatically flips from frame to frame as you paint, thus creating an animation within an animation.

For example, suppose you created 20 frames where the word *Amiga* spins around once on its vertical axis. When you pick up the word as an animbrush and paint with it, it will spin as you move it around the screen. And by the way, you are not limited to one animbrush in any series of frames. Once you have painted an animbrush over a series of frames, you can go back to the beginning and paint with another animbrush and watch both move when you play the animation.

When you are finished, you can save the entire animation to disk in a standard Anim format which other programs can use. Moreover, Electronic Arts furnishes a Player Only program which you can freely distribute with your animations.

I have only scratched the surface of *DPaint III*'s animation capabilities; its uses are limited only by your imagination and the amount of experimentation you do. The package itself contains three non-protected disks: the program, an art disk and an animation disk. The latter contains several backgrounds and many professionally drawn anim brushes. The most impressive of these is an underwater scene where you can use anim brushes to paint various fish swimming around a lovely animated mermaid. The program also contains several impressive examples of Colorfonts—text characters which automatically use up to eight different colors specified by the fonts themselves. Two examples of the *Kara Fonts* series are included which give the realistic appearance of letters carved out of granite and chiseled letters of gold. Many different types of fonts can be purchased separately.

The 237-page manual is easy to understand, contains explicit tutorials and is replete with hints to enable even the novice to create stunning graphic effects.

Electronic Arts will continue to sell *DeluxePaint II* at the reduced price of $99.95. *DPaint II* owners can also upgrade to the new version, for details on the upgrade policy, call (800) 245-4525.

DPaint III is a powerful program which has kept up with the times and should continue to retain its place as the "standard" graphics paint program for the Amiga.

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as the total control synthesized music offers. David and I like the ability to manage every instrument and every musical note. The down side of that control is complexity—you have to know everything about the music you want to create. You have to know where the bass track goes and when to bring in the wind section. But by using the Amiga to break each section of the music into individual tracks and instruments even that complexity is manageable—you just break the music into small controllable tasks. And the final results are really impressive. We're creating music here that would have required an expensive sound studio, dozens of performers and sound engineers just a few years ago. Everybody is talking about desktop publishing and desktop video, well we've got professional-quality desktop music too.

> "It just seemed logical to add a computer to my setup because the computer allowed me to add any instrument I wanted."
> —Lewis

Fields: This room is filled with expensive-looking electronic devices—a drum machine, keyboards, tone generator, effect units, recorders, mixing box, etc. Is all this necessary to compose or perform electronic music?
Brown: I had most of this equipment before I bought a computer. I added the Amiga to control them. But the Amiga alone is all a beginning musician needs. My Amiga 1000's internal voices are great for drum and bass sounds, but for high-frequency sounds the external instruments are better.
Lewis: That's true, but because the 500 has a switchable low-pass filter it can produce quality sounds—both high and low frequency. But to answer the question, all you really need to get started is the computer and software. As you get more involved, you'll probably want to add a MIDI keyboard. But you don't have to until you are ready—some software lets you use the Amiga's keyboard just like a MIDI interfaced device. But prices of keyboards are coming down. You can get a MIDI keyboard for under $200, and the prices are still falling.
Fields: Do you have to be a musician to use the Amiga?
Brown: Well it hasn't stopped me, has it? Let me get serious. If you are a musician, you're going to be able to do more and do it quicker. But for somebody who knows nothing about music, an excellent place to start is a little program called *Instant Music*. You just load it and it makes music quick and easy. You don't have a lot of control over the music, but you can make some good-sounding music. It is sort of the first level in music software.
Lewis: All you have to do is move the mouse and it picks up semi-tones and harmonics and matches them up with the music it is playing. It hits the right notes. It filters your input so you can't strike any sour notes, but it limits your creativity. You don't have to be a musician to make something sound right. It is more a toy than anything; it would be ideal for someone interested in music, but without a real background in music. It would be good for getting children interested in music.
Fields: Okay, now that I know that I can get great music out of the Amiga, where do I turn to get serious?
Brown: You can get some very professional results out of *Deluxe Music Construction Set*. I still use it every day. It is an excellent note editor. It not only lets you edit the music, but will also play it back and even let you edit it while it is playing, and it includes an option to print out music as well. It just has so much going for it. And, of course it includes MIDI.
Lewis: I guess one of the most well-known developers of music programs for the Amiga is a company called Dr. T's. They have an excellent entry-level sequencer called *MIDI Recording Studio* and a professional-level [sequencer] called *KCS, (Keyboard Controlled Sequencer)*. For pure quality, they are probably the top of the line. I like *MIDI Magic* and *Dynamic Studio*, and David uses *AudioMaster* to sample sounds. There's a lot of good software out there. *Music-X* sounds like it will be a great program if it is ever released.
Fields: Assuming you already have a computer and music software, what is the next logical addition? A keyboard?
Lewis: Well, before adding anything, I would suggest you increase your Amiga's memory to at least one megabyte. The first thing you'll say if you don't is "Whoa, I wish I had more memory." To create and edit lengthy compositions requires expanded memory. After that you would want a MIDI interface and a keyboard, or some sort of MIDI device.
Fields: What is MIDI and why is it important?
Brown: *MIDI* stands for "Musical Instrument Digital Interface." It is a digital communication protocol which allows devices like computers and keyboards to talk with each other.
Lewis: If the standard hadn't been established, equipment would be a lot more expensive, and hooking up computers and keyboards would probably be a headache. But because of the standard, all the user really has to do is make sure the instruments they want to hook up to the Amiga have a MIDI port and the software they buy supports it and most do. The important fact about all this is that there *is* a MIDI standard. I think that is why the prices of interfaces and MIDI devices are coming down. The manufacturers are assured their products have an outlet which is compatible across the board.

> "For somebody who knows nothing about music, an excellent place to start is a little program called *Instant Music*." —Brown

Fields: Are MIDI interfaces expensive?
Lewis: You can get one as cheap as $39. The one I use costs only $60 and it is relatively deluxe. So compared to other electronic devices, a MIDI interface is inexpensive.
Fields: Is connecting a MIDI device difficult?
Brown: It really couldn't be easier. You plug the MIDI interface into the serial port on the computer and then plug the other end of the cable into the MIDI port on a device. And because most devices have MIDI input, output and "thru" ports, you can daisy chain several devices to the same computer. You don't have to know how a MIDI translates signals between the device and computer—the software takes care of that. All you have to do is plug the two together, set the MIDI channels and load your software. The software controls what sounds the keyboard and computer will make and what will happen when a key on either is pressed. That's a simplified explanation, but basically that's how it works.
Fields: After you have your MIDI keyboard attached to the Amiga, what is the next step?
Lewis: You use a sequence program and a

MIDI keyboard to capture notes played on the external instrument. Then you can take the file created with those captured notes and load it into a program like *Deluxe Music Construction Set (DMCS)* which can translate the sequence into screen represented sheet music. We use the sequencer as a sort of digital tape recorder to lay down multiple tracks, so we can control up to 16 different instruments.

Fields: Can you edit the notes captured by the sequencer software before loading it into *DMCS?*

> "The Amiga is the brains of the music, sort of like the conductor of an orchestra." —Brown

Lewis: Yes. Although some sequencers are more difficult to work with than others. I prefer to simply load the sequence file into *DMCS* and edit and listen to it there. Then when I have the music sounding just right I save it to disk where I can play it back or edit it. I like *DMCS* because it displays the score using traditional musical notation and staves, plus you can instantly listen to the effects of your editing. Other sequencers let you edit the score by altering number values, sort of like updating a file from a database, but I prefer the more traditional approach.

Fields: Both of you keep mentioning *Deluxe Music Construction Set.* That program has been around a long time. Why do you use it instead of some of the newer programs?

Brown: I like *DMCS* because it shows actual notes on the screen and includes the ability to dump the music to a printer. It is the program I started with, and I feel comfortable with it. When I outgrow it or see something better, I'll switch.

Lewis: Well, it's affordable. But it is not really a sequencer program. I'd like to see Electronic Arts update the program and add features. The more involved I get with MIDI and computer-generated music, the more features I wish the software offered. *DMCS* isn't a bad program, after all, I use it every day. I'd just like to see an update.

Fields: Why is a computer important to creating music? Couldn't you just play and record one instrument and then keep playing and recording more until you had everything on the tape you wanted?

Brown: The Amiga is the brains of the music, sort of like the conductor of an orchestra. When it is connected to other musical devices through a MIDI interface it can tell them what to play, when to play, how loud to play, etc. And it never misses a beat.

Lewis: If you did that, you would have to know how to play every different instrument. But because the computer can synthesize different voices, I can play a violin or any musical instrument without learning anything but the keyboard. Plus synthesized instruments don't cost anything, don't take up floor space and don't have to be tuned.

Fields: Why is the Amiga important?

Brown: The software is like the conductor in an orchestra, and the MIDI is the visual signal the musicians respond to, and the devices sitting on the end of the MIDI cable are the performers—the instruments. And what is the music? The music is the music.

Lewis: I don't know if that analogy is perfect, but the important thing is that when the computer, MIDI interface, MIDI devices and the software are all working, the music possibilities are almost infinite. Even though only 16 MIDI channels are open to the computer, I know of no physical limit on the number of devices you can connect and control. Because the sound quality of each device can change, there is no limit to how many instruments can be played under the Amiga's direction. The device could sound like a violin, then change to a piano, then a harpsichord, etc. Because the Amiga has only four voices, it can only play four instruments internally, but that doesn't restrict how many external devices it can handle. The number of possible voices keeps multiplying.

Brown: That is what is so great about MIDI and the Amiga. Remember you can attach another Amiga to the original system through one of those channels, and presto you've multiplied voices and MIDI channels. This gives you the ability to control a huge orchestra instead of just four instruments. That is real power. This means you can control, afford and fit a professional-sounding orchestra in your own office. There is no limit to what you can do if you keep adding MIDI devices, interfaces and computers. The only problem you might run into is that your orchestra might get too big to control, and the music might get too complex.

Fields: What do you do after you have your music composed? Do you simply record it on tape or what?

Brown: Well first you would save it to disk, so you could always go back and either add to or edit it.

Lewis: Then you could output it to a track of a cassette recorder. But once you have one track perfected, you can ignore it and go about either adding another instrument or whatever to get the exact sound you want. What's great about computers is that nothing is written in stone. You can always take your original music and change it to suit your whims or musical taste. Plus you don't have to hire or pay a piano player just to make a few changes to the piano track of a composition—you simply load in that instrument and do it

> "Synthesized instruments don't cost anything, don't take up floor space and don't have to be tuned." —Lewis

yourself. The Amiga, music software and MIDI make it possible for the individual to create the professional sounds normally associated with expensive recording studios and high-priced musicians. It really is great.

Fields: What is a sampler and what is it used for?

Brown: A sampler is a combination of hardware and software which is used to digitize real-life sound effects which can be used either in music or replayed simply as a digitized sound effects. The hardware gives you a port to the computer's memory, and the software controls what information (sounds) is captured through that port. A good example of a digitized sample would be a game which includes real-life speech—not computer-synthesized voices.

To capture a sample all you do is plug your digitizing hardware into the computer and then boot your sampling software. When you are ready, you tell the software to begin sampling the sound going through the microphone, and when the sound ends, you tell the software to end its sampling process.

A sample is like a piece of voice sound recorded on magnetic tape except it is digitally encoded into the computer. For example, if I say "yes" and record it on tape, I can play that sound back. But once captured, the software allows you to save it as a file which can be used by other software or you can even edit the sample—turning it into unearthly sounds.

Lewis: Any sound you can capture can be turned into an IFF instrument and played just like any other on a keyboard or through the computer. Or you could

simply play the sample—the digitized sound—back through software for some interesting effects. The software also lets you cut and edit the sample you capture. So you can stretch or alter effects until they sound exactly the way you want. As an example, you can reverse the sounds and play them backwards. It is all very easy to do on the Amiga.

Fields: What are your goals?

Brown: Right now I am just enjoying the music. I really like what I am doing and what I am able to do with this system. I plan to make some music with the setup eventually. Al and I have been approached to compose and perform soundtracks for two different video production companies. That is our immediate goal. But right now I'm not worrying about making money. I'm just enjoying the music and learning.

I used to have great expectations because like most young musicians I felt my "music was so great" others had to hear it. But I've mellowed. There is a lot of competition out there. I'm willing to accept whatever the future brings.

> "Any sound you can capture can be turned into an IFF instrument and played just like any other on a keyboard or through the computer."
> —Lewis

Lewis: I've written a couple of songs which I think have commercial possibilities. I'm looking for a market for them. But like David, right now I'm really consumed with learning and exploring the possibilities. But down the road, I hope to make a lot of money with my talent and what the hardware and software help me to create. Everything I write is for sale.

Fields: Why are you two working together? I thought the idea of getting involved with MIDI and computers was to not have to contend with the influence of others.

Brown: No, that is not entirely true. Al has knowledge and strengths which I am drawing on, and I think I have some expertise in fields which will help him. Right now we are learning from each other. We are both enjoying working together. We have similar interests. What the future holds for us, I don't know. But right now we're just enjoying working with each other and each other's music. ■

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using magnetic tape for storage of the sound, your storage device will be a combination of RAM and disk. RAM is used while the sound is being captured and edited, and the disk is used for permanent storage.

If you are an Amiga-based musician, you may already be delighted with the established music-related software base. But the titles now on the shelves will soon be joined by a load of new, quality offerings. Almost every software developer I talked with, was either nearing completion, working on, or at least planning a music-related release for the Amiga. The fact that serious musicians have recognized the Amiga's desktop music capabilities and are switching to it has not gone unnoticed by software developers. Here are some of the better packages with which I had a chance to experiment.

Some Impressive Programs

Keyboard Controlled Sequencer

It's hard to think of computer-controlled music without thinking of Dr. T's Music Software (the company gets its name from Dr. Emile Tobenfeld). *KCS* is the name of their top-of-the-line sequencer. It offers three modes of operation: track, open and song.

In track mode, the sequencer functions as a 48-track tape recorder with automatic looping. You can record and store up to 47 tracks automatically muting and saving each. The program is controlled through a screen-displayed tape recorder, allowing the user to record, pause and play as easily as pressing a button. Editing options include merge, echo, solo and mute. A powerful "find" option lets the user quickly locate a defined measure similar to the way a word processor lets the user find all the occurrences of a character pattern.

Song mode provides a simple method for chaining sequence segments into the same song. Tempo and volume for each segment can be specified separately. The mode allows up to 16 separate songs to be in memory and acted upon at one time.

MIDI Recording Studio

MIDI Recording Studio (MRS) is not only the least expensive sequencer I've tried, but because all of its features can be mouse activated, it is also easy to use. The program allows the user to use the Amiga's keyboard, as well as true external MIDI devices, as a musical keyboard (would-be musicians interested in testing the Amiga's sound waves before taking the financial plunge for a MIDI interface and keyboard will appreciate this fact).

With *MRS*'s editing features, you can mute and unmute tracks (it uses eight) and cut, copy, paste or transpose musical information just like you would with a word processor. But because the program offers no printout option, you'll have to transfer music files to another program (like *Copyist)* if you want sheet music.

MIDI Magic

MIDI Magic is a powerful sequencer which uses simple tape recorder-like controls to record, rewind and play music captured through the MIDI port. It employs a unique visual metronome (the title menu pulses with the beat), so if your keyboard is across the room you should still be able to see it. Because of this, unless your MIDI devices is over 30 feet away, you can still see and keep the beat. The program provides sensible cue options, so you can time your first note exactly. Controls include tempo, metronome, clock source and output (MIDI, drum sync or none). Because the program was designed for the Amiga, it takes full advantage of available memory, RAM: storage and multitasking.

Once a score has been sequenced, flexible editing tools allow you to alter any of the 16 tracks. Options include transpose, erase, copy, shift, invert, append, loop, and change time. Individual notes can be turned on or off. As the name implies, *MIDI Magic* is for MIDI device owners only—no MIDI, no music.

One other welcome feature is intensive on-line help. If you don't understand an option, all you need to do is activated the "?" option and select the help from the areas listed in the help window.

Dynamic Studio

Dynamic Studio is just that—a complete music studio. It comes with a powerful sequencer, editor and built-in drum machine and, of course, includes MIDI. The drum machine lets you load or define ten separate sounds and assign them to the numeric keyboard. You can adjust each to suit the requirements of the music you will be performing and instantly test the changes. In a very real sense, this puts the beat at your fingertips.

The sequencer option of *Dynamic Studio* lets you record and modify any data coming from a MIDI device. Bad notes can be edited out, the time adjusted, sections automatically repeated. Track menu options let you merge, filter, copy, erase, rechannel, randomize and alter the data on

any of the 16 channels. Built-in filters let you ignore certain MIDI data while recording a sequence. *Dynamic Studio* includes pitchwheel and polyphonic pressure controls.

It also has a librarian option which lets you store system-exclusive information. Serving like a musical database manager, librarian lets you upload or download data between disk and a MIDI device. At first glance, the options and exacting sound controls *Dynamic Studio* puts in the user's hands can be unnerving. But with a little testing, anyone can master the program.

Beyond the obvious applications digitized sounds offer the serious musician, playing with them is just plain fun.

Pro Sound Designer

Pro Sound Designer, Gold Edition is a digitizing system complete with hardware and software. *Designer* has a full 1–32 kHz frequency response range with a good signal-to-noise ratio. More than simply allowing you to capture real-life sounds in either stereo or mono, the software lets you edit and manipulate one to four sound samples at the same time. Cut, paste and overlay features are included, along with a facility for changing frequencies and octaves. Sound samples can easily be converted for use as instrument voices which can be accessed by either a MIDI keyboard or the Amiga. The hardware comes with a gender changer so it will work with either the 500, 1000 or series 2000 Amigas.

[***Editor's Note:** See complete review on page 27.*]

AudioMaster II

AudioMaster II is a digital sampling system which offers not only the largest oscilloscope display I've seen, but offers two of them and supports stereo. The software offers sampling rates as high as 56,000 times a second (a rate higher than that of an audio compact disc) providing your Amiga has the 68020 processor. Samples can be visually clipped and edited using a combination of screen-displayed buttons and pull-down menus. Providing you have sufficient memory, any sample can be sounded in a continuous loop during your editing session. Both pros and hobbyists will be delighted with the easy-to-use options and controls packed in this sampler.

Beyond the obvious applications digitized sounds offer the serious musician, playing with them is just plain fun. I digitized the voices of my two children (ages eight and 13) and then lowered each by two octaves to get a good idea of how their voices will sound when they are grown. If you want to entertain (or embarrass) your friends, you can't beat the fun of digitizing and then editing their conversations. Finished sounds can be stored in either IFF or *Sonix* format. A print waveform display option is also included.

Perfect Sound

Perfect Sound is a stereo digitizing package which includes both the hardware and software for capturing and editing real-life sounds. Compared to the other two sampling products, the software here isn't as flashy, but it still produces excellent results. It's always nice to find an affordable product that delivers quality results. The audio digitizer samples sounds at rates between 5000 to 25,000 times a second and converts them into a series of numbers the computer can understand to recreate the exact sample. But to use the sampler, all you need is an ear and the ability to move your mouse. The program supports the IFF sound format and can create instruments for music programs. For the price, this one is well worth investigating. It offers stereo-capturing channels and hardware volume controls.

Synthia

Synthia lives up to its claim to be a high-performance digital synthesizer. In fact the master disk contains not one, but five synthesizer modes: Subtractive, Additive, Interpolation, String and Percussion. Each allows the user to employ the unique attributes of each particular synthesizer without burdening them with the limitation of the others. Because *Synthia* was designed for multitasking use, you can actually define and listen to instruments with several different modes all at the same time. The program includes MIDI and will allow you to test sounds with either the MIDI or computer keyboard as well as the mouse. Synthia uses a multitude of screens and panels to give the user maximum control over each sound including a waveshaper, harmonic mixing, amplifiers and filters. At first glance, all these controls can be intimidating, but with a little hands-on testing, the controls and their logic is apparent.

The two-disk kit also contains a program called SMUSPlayer which lets you play SMUS-IFF music files independent of *Synthia*. It can handle scores of up to 32 tracks containing up to 32 instruments.

Studio Magic

Studio Magic could be called a musician's digital toolbox. The program includes a MIDI sequencer, so you can record music in real time plus a sound-editing screen and options which let you listen to and edit selected sections of the sequence. Pull-down menus make loading, editing, altering and saving musical scores intuitively simple. To get the most out of *Studio Magic* you'll need a MIDI device attached, but even without one you can still load sequences or digitized samples, fine tune them and use them with other programs. Much of the appeal of this program is that it lets you cut and paste patches of sound much like you edit type with a word processor. The real power of *Studio Magic* is its heavy-duty arsenal of tools including tempo adjust, append, overlay, insert, bevel, compress, rescale, interpolate and a variety of filters. You can load any IFF digital sound and convert it to a unique IFF instrument.

Sonix

Sonix is a digital synthesizer which supports eight MIDI voices and up to 32 channels and its own as well as the standard IFF filing format. Those who are more comfortable with musical notations than programming jargon will like *Sonix* displays, since each musical notation is displayed graphically (using traditional symbols) rather than as numerical values. The program's stereo output can be directed through the Amiga's external sound connections or a MIDI controller. Because the program was developed on the Amiga, its mouse-activated interface is easy to use.

Despite its low price, *Sonix* offers professional-level power including the ability to create, modify and edit any type of synthetic or digitally sampled sounds. Customized sounds created with the program's waveform editor can be used as an instrument played from either the keyboard or via a MIDI device. Using word processor-like controls, you can compose and edit music (using standard notation) on the monitor screen, plus listen to the changes you make as you make them. Finished scores can either be saved to disk or dumped to a printer as sheet music.

Deluxe Music Construction Set

Deluxe Music Construction Set has been around since 1986 and still has a faithful

following. The screen display here is divided into several windows, but the main one displays the score using traditional music notation. A toolbox allows the user to edit the composition using cut and paste features like those you would find on a word processor. The program includes MIDI, an on-screen keyboard and printout options; it also allows the user to input lyrics as well as sound information. The program comes with 15 good IFF-sampled sounds, but more can easily be imported. The program is copy protected, but unprotected disks can be purchased for installation on a hard drive. Because of the program's intuitive design and professional options, it is a program both entry-level and experienced musicians will appreciate.

Music-Related Products

Copyist

Copyist is a desktop publishing transcription and scoring program. There are actually three versions of *Copyist*—Apprentice, Professional and DTP. The entry-level program allows the user to edit and print five pages of music using a dot matrix printer. The Professional version increases the page capacity to 50; includes Macro controls and a font editor; and supports dot matrix, laser and ink jet printers as well as plotters. The top-of-the-line *Copyist* DTP can handle up to 100 pages of music and Adobe Sonata fonts, and it supports PostScript-compatible printers.

The power of these programs is visual not audible. In fact, none include any option to sound the musical scores they allow you to edit, but because they support multitasking, you can use *MRS* or some other recorder to listen to scores. The main purpose of the programs is to let you easily transcribe files from *KCS* format, standard MIDI or SMUS.

Once loaded into memory, you can edit any score using either pull-down menus or direct keyboard commands. Any sections of the score can be duplicated, moved, deleted or edited. Or if you prefer, you can simply load blank staves and input musical notation directly—everything will appear on screen exactly as it will be printed. When you are finished, you can either save the results to disk (changing formats if you wish) or print it on paper.

Music Student I

Music Student I is the first in a planned series of music teaching aids. The program is designed to strengthen the user's knowledge of music. The special emphasis in volume one is musical symbols and terms as well as the training of the student's ear to recognize chords, scales and keys. This is accomplished via a battery of tests administered by the computer. Each student is assigned a password, and he or she can progress at an individual speed or at a rate regulated by the teacher. The program's database keeps track of each student's progress. *Music Student* can keep track of the scores of up to 200 students.

Music-X

I had hoped to tell you a little about *Music-X*, but the review copy we were promised never materialized. But MicroIllusions' David Boyles assures me the product is ready for release, and the company is just waiting for the manual to be completed before starting to fill orders. More than a few musicians have been eagerly awaiting the release of this program. Based on developer's promises it could be the most impressive, powerful and feature-laden piece of music software yet developed for any system. They have been promising that for nearly two years now (an old news release projected it would be released 1/87), but hopefully by the time you read this, the wait will be over.

MicroIllusions claims the program will include a sequencer, keymap and patch editor, MIDI and a master clock accurate to one millisecond, plus plenty more. They even boast that users will be able to edit a score while still recording. Rather than rush a half-baked program to market, the company has devoted two years of development time and thousands of promotional dollars readying the program for the public and readying the public for the program. If *Music-X* lives up to just half the hoopla it has generated, it should be a wonderful addition to the Amiga library.

Conclusion

The bottom line is that creating performance-quality music on the Amiga is a reality, and you don't have to be an accomplished musician to use it. The software available now makes it easy to get pleasing results by simply "tweaking the knobs" and listening. By the same token, the power of Amiga means anyone who has studied music can put his or her talents to work and harvest impressive results quickly. For serious musicians and the rest of us who simply enjoy music, the Amiga packs a studio full of musical treats worth exploring. So, until next time, keep a spring in your step, a song in your heart and a tune playing on your Amiga. ■

PRODUCT INFORMATION

ACS Software
2135 E. Sunshine, Suite 106
Springfield, MO 65804
(417) 887-9923
Music Student I $59.95

Aegis Development
2210 Wilshire Blvd., Suite 277
Santa Monica, CA 90403
(213) 392-9972
Sonix $79.95
AudioMaster II $99.95

Brown-Wagh Publishing
16795 Lark Avenue, Suite 210
Los Gatos, CA 95030
(408) 395-3838
MIDI Magic $149.95

Dr. T's Music Software
220 Boylston Street, Suite 206
Chesnut Hill, MA 02167
(617) 244-6954
Copyist Apprentice $99.00
Copyist Professional $275.00
Copyist DTP $399.00
Keyboard Controlled Sequencer (KCS) V1.6 $249.00
MIDI Recording Studio (MRS) V1.1 $69.00

Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
(415) 571-7171
Deluxe Music Construction Set $99.95
Instant Music $49.95

MicroIllusions
P.O. Box 3475
17408 Chatsworth Street
Granada Hills, CA 91344
(818) 360-3715
Music-X $299.95

New Wave Software
P.O. Box 438
St. Clair Shores, MI 48080
(313) 771-4465
Dynamic Studio $199.95

The Other Guys Software
55 N. Main Street, Suite 301
Logan, UT 84321
(801) 753-7620
Synthia $99.99

Precision Software, Inc.
8404 Sterling Street, Suite A
Irving, TX 75063
(214) 929-4888
Pro Sound Designer, Gold Edition (with hardware) $159.95

SunRize Industries
3801 Old College Road
Bryan, TX 77801
(409) 846-1311
Perfect Sound (with hardware) $89.95
Studio Magic $99.95

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white flag, with no other input, the printer will list all countries with red and white flags. If you add the determined currency and language, the list will contain fewer country choices.

Every so often, a window opens up in the middle of the screen that provides additional clues such as: "Call from the Chief. We've confirmed the suspect is only interested in comic films." This information can be added to the Crime Lab notebook. Information entered in the notebook is transferred to the Crime Lab computer via the "Enter Crime Notes" option.

If there is enough information in the Crime Lab computer, so that only one suspect on the list matches, then a warrant is automatically issued and printed on the screen. If not enough information is available, then that is so indicated. If you enter the wrong data, you will issue the wrong warrant, then you will not capture the gang member. If you are in the right town and no warrant is issued, an on-screen note indicates that you cannot capture the person.

The "investigative" time limit is always six days exactly from the time shown initially on the screen. Time is added to the on-screen clock every time you make an investigation, travel to a different city, go to the Crime Lab, use the database or accomplish any task. There is even time added for "sleeping."

Closing the Case

Whenever you are on the right track, visual and audio clues are provided. In addition, a message is given: "A VILE (Villains International League of Evil) henchman. You must be on the right track." If you are not on the right track, then you get a negative response to investigations made in the new city location. If you travel to the wrong city, you should return to the original city and essentially start over.

If you do not find the thief in the allotted amount of time, you are returned to the office and receive a message from the chief offering another case. However, when the player enters the correct hideout town location, and a correct warrant has been issued, there are graphics showing police hauling away the criminal, the criminal standing before a magistrate, and a "guilty" verdict being voiced by the judge.

New Features

New features not found in the previous *Carmen Sandiego* programs include the computer notebook and Crime Lab. Another new feature is the call from the Chief.

The database is yet another new, and very powerful, educational feature. The database provides a computer-aided instruction environment. Players reinforce their knowledge of Europe by the repeated use of database information to capture gang members.

Educational Information and Effectiveness

There are almost 1000 clues in the game. As players gain experience, the clues become more challenging. Resources include an enclosed *Rand McNally Concise Atlas of Europe*—made especially for Broderbund. This 100-page book itself is probably worth half the cost of the software package. The Atlas is four-color and loaded with textual information about each of the European countries.

Players learn about European geography, history, economy and culture, while developing valuable organizing, analyzing and research skills. Concept skills of deductive reasoning, reference and research are developed. Content skills are developed about European geography, history and economy.

There is cultural information, and introduction to cultural terminology—such as "epic poems." Players are made aware of types of literature. Much information other than geographic is presented in an almost subliminal approach.

Evaluation

There is no question in my mind that this software package is worthy of any excellence award. The addition of the CAI-like database is a welcome improvement, adding to the educational value.

My research (with my own two children) proved that this program reinforced educational information provided by the local school system. It is this reinforcement that enhances the learning experience.

The format of these programs is excellent—for both child and adult. Adults will be equally stimulated by the challenge of finding the thieves. (Did I tell you that I failed my first case because of time?)

The graphics are excellent. The user's manual is superb, providing not only operational information, but also information to help players develop strategy to find the thieves.

There is no end in sight as to the potential for this series. Keep it up, Broderbund! The series is great educational enjoyment—for both children and adults. ■

Ancillary Material Improves Educational Value

Because of the overwhelming acceptance of the *Carmen Sandiego* series, Broderbund provides two major educational support packages.

One package is a School edition; the other a Lab Pack edition—each containing a "Teacher's Guide." The Teacher's Guide is a 43-page manual that includes reproducible maps, suggested school activities, European flag sheets, a European language tree and a glossary. The school version contains one backup disk, while the lab pack version includes five disks.

Also available to educators is "The Carmen Sandiego Day Kit." This kit includes sample letters to parents, public service announcements, maps, geographic terms, a database, European flag information, suspect description, investigation activity sheets, as well as Carmen Day "Suggested Activities."

According to Ingrid Wallace, Broderbund's manager of educational marketing, "The world's first known Carmen Sandiego Day was held in Bluffton, Indiana on March 4, 1988. Credit goes to a fourth-grade teacher—Jon Bennett—and his students at Eastside Elementary School who organized the event. Bennett's students spent an entire day learning about the places the Sandiego gang members used as hideouts, the hobbies and sports for which they are known, and their favorite meals."

Suggested activities for Carmen Sandiego Day include language arts, art, music, geography and other database activities using the *Carmen Sandiego* programs as a focal point. There are sample news releases and a radio script. In addition, Broderbund provides stickers for each student, and a reproducible "Certificate of Participation."

There is a four-week, week-by-week planning guide, that leads to the actual Carmen Sandiego Day. Advance notice to Broderbund will even get Carmen Sandiego herself to call the school. Parents play a big part in the activities by preparing special foods and giving demonstrations of activities mentioned in the programs.

This "Carmen Day" activity package has been so successful, that Broderbund (who originally mailed free copies) must now charge $10 for shipping and handling of these kits.

Are the School edition, Lab Packs and "Carmen Day" kits worth it? You bet!

Continued from page 61

Silver: VLT by Willy Langeveld
(AmigaZone file #14025)

Although we've had terminal programs that have supported VT100 emulation and/or Textronix emulation, none have done so in as powerful and versatile a package as VLT. One of VLT's major attractions, of course, is its AREXX support, which is all I need say to the growing group of AREXX supporters.

VLT has other important features like its own internal macros, 15 different parity settings, Ymodem support and graphics operation support for pan, zoom and a crosshair.

Perhaps more important is what VLT is being used for. I'm referring to how VLT serves as an important link for the Stanford Linear Accelerator Center (SLAC) to be able to use Amigas. What's so noteworthy about that? Well, when Jerry Pournelle, that famous doubter of the Amiga's worthiness, saw how the Amiga was being used at SLAC, it gave him a much higher regard for the Amiga and its capabilities.

Bronze: AZComm by S.S. Patel
(AmigaZone file #13942)

While Amiga terminal programs have come a long way, there's still a long way to go. One major joke with the Amiga and its terminal capabilities (at least as far as MS-DOS telecomm addicts are concerned) is that not too long ago there was *no decent* support of Zmodem in any terminal program (commercial or PD) for the Amiga. Sure MicroSystems Software's *Online!* version 2.0 supported Zmodem. It was also a joke trying to use Zmodem with *Online!* at times, since when you were linking up with BBS-PC! or another *Online!* program, the block transfer size never rose above 256 bytes—no matter how clean the line was. It goes without saying that *Online!* didn't support Zmodem's valuable Resume feature (actually it does, but since there is no menu option for this feature and the topic isn't even discussed in manual, you might as well say it isn't supported at all).

AZComm is a simple derivative of Communicator version 1.34, with one major difference: Zmodem support. AZComm supports the variable transfer block size of Zmodem, all the way up to 1K blocks. AZComm also supports resumed Zmodem transfers as a mention option.

However, AZComm goes much further than simply supporting the aspects of ZModem that MSS forgot. AZComm was really designed with high-speed Zmodem transfers in mind. While you might have been satisfied with Zmodem transfer speeds using *Online!* or ProtoComm at 1200 or 2400 baud, these programs weren't designed with high-speed modems in mind. The author claims that AZComm is the only terminal program that can keep up with 9600+ baud Zmodem transfers.

Finally, AZComm is the most robust terminal program I've ever seen concerning Zmodem file transfers. Often when transferring files with a friend via a noisy phone line, we can't rely on *Online!*, ProtoComm or Access/RZSZ to transfer the whole file without one side aborting. Only AZComm is robust enough to get the job done.

Honorable Mention: Emit
by Justin McCormick

While you can't perform file transfers over a modem faster than 19.2KBaud, it isn't the Amiga's fault. Standard phone lines have trouble with baud rates above 10KBaud, but the Amiga itself doesn't even work up a sweat at that speed. Emit is the only terminal program that can make a null modem transfer between two Amigas efficient. You may be shocked once you try Emit and find that null modem transfer speeds between two Amigas can top 270KBaud, but that's only because of how slow other terminal programs really are.

Terminal Utilities

Gold: RZSZ by Frank Anthes-Harper
(AmigaZone file #13408)

Since Access! was awarded the gold medal in the Terminal Programs category, it makes sense to award the top honors in this category to the two programs that make it possible to perform Ymodem and Zmodem transfers with Access! (RZ handles the downloading, and SZ handles the uploading.) Of course, RZSZ has the potential to help bolster the capabilities of many terminal programs, but since only Access! allows you to tell it to stop listening to the serial port, this is the only terminal program that can be used with RZSZ. However, for many Amiga users, that's the only one they care about.

Silver: AtomClock by Art Steinmetz
(AmigaZone file #13833)

Although this program has nothing to do with normal terminal programs, it does access a modem, therefore I felt it belonged in this category. Some may consider AtomClock frivolous, but for those who demand that the Amiga's real-time clock be accurate to the second and don't mind a long distance call to the U.S. Naval Observatory in Washington, AtomClock is a wonderful utility.

Bronze: Ovdemo by John Nagel
(AmigaZone file #14623)

This program may not seem important to most of you, but as a BBS sysop, I am shocked to see the ridiculous passwords some of my callers use! For example I've seen "Amiga" as a password, and I've seen one-letter passwords. Ovdemo is a bit complex in that it checks your password against all common English three-letter combinations; if your password has two many of these combinations, it tells you your password is too obvious. (It assumes that you are *trying* to use a non-obvious password.) Anything that helps protect bulletin board users from people illegally logging on and using their accounts is very worthwhile.

Honorable Mention: Savemoney
by Steve Pietrowicz
(AmigaZone file #12609)

Users of other networks besides PeopleLink (like GEnie and CompuServe) may feel this award is given simply because I'm biased towards PeopleLink and I'm blatantly flaunting that bias. While I'll admit a bias towards PeopleLink, the *real* reason for this award is not due to partisanship. Savemoney is important simply because it shows people how inexpensive accessing an online information service can be. In that regard, Savemoney is extremely effective. (Although it's intended only for those who are already using PeopleLink, it can serve a similar purpose for users of other services by simply comparing their rates to PeopleLink's rates via PC-Pursuit.)

I do wish that *all* online services could be as inexpensive as PeopleLink/PC-Pursuit's rate of $3/hour at 2400 baud. Unfortunately, of the four major online services that support the Amiga (BIX being the fourth), PeopleLink is the least expensive (even after Telenet finally removes unlimited usage from PC-Pursuit this summer).

Virus Protection Programs

Gold: VirusX by Steve Tibbett
(AmigaZone file #15414)

This was the easiest award to choose this year. Anyone who is using VirusX knows I don't have to bother justifying this award. Steve Tibbett has become quite famous in the Amiga community for VirusX, the virus detection/elimination program that has no peers. It's not just

that VirusX protects against the largest number of viruses (16) either.

First of all, VirusX was the first virus checker program that continuously stayed in memory, immediately checking each and every disk inserted into a floppy drive. One-time virus checkers like VirusCheck (which won the gold medal last year) and its predecessors were sufficient if you were only concerned about checking a particular disk via the startup-sequence. However, they were useless once your system had booted up, since no one would run VirusCheck *every* time they inserted a new disk into the system (and once you stop checking disks, you're system is no longer secure).

VirusX was also the first virus utility to support the Workbench, which made it possible for every Amiga user to guard against viruses. And VirusX is still the only virus checker that protects you from non-boot block viruses, namely the IRQ virus. (Fortunately, no other non-boot block viruses have appeared!)

Awarding a gold medal to VirusX was all too easy. Placing VirusX in the PD Hall of Fame next year may not be too tough either.

Silver: ViewBoot by Brian Meadows (AmigaZone file #10176)

ViewBoot added a new defense against viruses in 1988. ViewBoot was the first program to allow users to easily view a floppy disk's boot blocks in ASCII form. (Of course, you could have looked at them with some disk editors, but that meant you first had to become proficient with the disk editor program, unlike ViewBoot which makes it as painless as possible.) This makes it possible for the user to determine if a virus is indeed hiding inside the boot blocks.

Of course, ViewBoot couldn't help you to eliminate the virus, but at least it made you aware of the fact that your system had been infected.

Once Steve Tibbett's VirusX included the option to view the boot blocks, ViewBoot was relegated to the attic, but it was the first program to bring this option to the Amiga community.

Bronze: BootBack by David Joiner (Fish 157)

While Discovery's *VIP* program was supposed to be very powerful in terms of helping the average Amiga user protect himself against viruses, its only unique feature (the ability to back up the custom boot blocks on a floppy disk) was quickly duplicated by BootBack and several other Amiga PD programs.

Today programs like SafeBoot and DiskX are a bit more versatile than BootBack in terms of performing this function, but BootBack was the ground-breaking program in this area. As you might expect, the early bird gets the worm (and the bronze medal).

System Utilities

Gold: MachII by Brian Moats (AmigaZone file #11741)

You know a program has improved tremendously when it jumps from an honorable mention last year to a gold medal award this year. The latest MachII not only has dozens of features, but its configuration requester also makes it very easy to change the various settings and see at a glance what the current settings are. MachII allows you to save multiple configuration files on your system disk (you can even load multiple settings at once), and instantly change between configurations with a click of the mouse. MachII is still the best multi-utility program available for the Amiga today.

Silver: Fix_1 by Bryce Nesbitt

While many of us were pleased when Commodore first released Kickstart in ROM with the introduction of the Amiga 500 and 2000, we expected to pay a price for this convenience. Bug fixes were certain to become much harder for Commodore to accomplish, and bugs that showed up in Kickstart after 1.2 would likely linger for longer periods of time. (This has also affected A1000 owners, since Commodore doesn't release Kickstart disk updates unless they will be updating the ROMs as well.)

Well, that theory was blown away when Bryce released Fix_1, which was able to patch two important bugs in Kickstart. Commodore now has adopted this program in 1.3 as SetPatch, but we would have had to wait six more months for these bug fixes if Fix_1 hadn't been written.

Bronze: PathAssign by Anders Lindgren (AmigaZone file #15282; Shareware: $10)

PathAssign has made life much easier for those who wished they could break their Fonts: directory into multiple parts, either because of disk space or programs that couldn't handle large directories. It can also help to better organize your system directories. This is especially effective if you have a hard drive, since you no longer need monster-sized C and Font: directories, which can be a real pain whenever you want a whole directory tree of your system disk (especially if you haven't switched from Dir to LS).

Honorable Mention: Cramden Utilities by Bill Barton (AmigaZone file #11726)

While it's nice to *finally* have an answer for all those MS-DOS users who ask if we have something similar to the world-famous Norton Utilities, it is even nicer to be able to benchmark various Amiga systems' performance capabilities versus stock Amiga and MS-DOS machines (and to all those who feel that Dhrystone tests are so great, all I have to say is how come I never see Dhrystone values quoted in ads for MS-DOS clones?). I still feel that Cramden's SI should take the graphics coprocessing of the Amiga into account, but that's the only glitch with Cramden's SI at this point.

Honorable Mention: Qmouse by Lyman Epp (AmigaZone file #12670; Shareware: $10)

Qmouse seems to have replaced Matt Dillon's Dmouse as the second favorite multi-utility of choice by Amiga users. Qmouse's tiny size (a result of being written in assembly language) makes it a favorite among those who have very little disk space to spare on their system disk.

Honorable Mention: SetCPU by Dave Haynie (AmigaZone file #15868)

SetCPU is considered important only by those with 68020/68030 boards. If you had a program that made certain operations in your Amiga up to four times as fast, you'd think it was pretty great too.

Honorable Mention: RemLib by Heiko Rath (Fish 139)

If you ever have problems with running low on memory, RemLib can help you to free up memory whenever possible. Sure, there is the FlushLibs option from the Workbench (now that the -Debug option for LoadWb is documented in 1.3, everybody knows about it), but if you don't have Workbench loaded to begin with, then using that is rather self-defeating. (You *do* know that not having Workbench loaded saves memory, right? Yet another reason to become proficient with the CLI.)

Disk/File Utilities

Gold: DiskSalv by Dave Haynie (AmigaZone file #14684)

DiskSalv first appeared way back in 1986. While the initial release showed us

all that there was a better way to salvage a disk than allowing that professor of binary medicine, AmigaDOS's DiskDoctor to perform malpractice on your floppies, it was unusable by many people, and was inconvenient for others. (It was still better than DiskDoctor, but we all know that isn't saying much.)

Two years and zillions of trashed disks later, Dave Haynie was able to dramatically improve DiskSalv so that Amiga users finally had no reason to ever use DiskDoctor. The single biggest problem with the original version of DiskSalv was that it required two floppy drives. That was first solved by allowing DiskSalv to output salvaged files to other devices like hard drives and the RAM: device.

For people with expanded Amigas that was enough, but what if you're a poor Amiga user with just one floppy drive and 512K of memory? No problem! DiskSalv's Ask command allows you to choose which files should be salvaged, making it possible to salvage a damaged disk one file at a time. (Of course, if you're trying to salvage a 450K file with only 512K of memory you won't be successful, but if you just walk down to your local dealer and pick up an A501, you'll be able to salvage the file.)

Since DiskSalv will also read from other devices, you can easily salvage a hard drive (even if it's FFS) in case you haven't bought a hard disk backup program yet or don't back it up as often as you should!

DiskSalv has many new features that made using it even more convenient, like filter options and adding filenotes to files that may be unrecoverable. The only reason you should even refer to DiskDoctor these days is if you're writing a letter to Commodore asking them to replace DiskDoctor with DiskSalv in Workbench 1.4.

Silver: TurboBackup
by Steffen Stempel and Martin Kopp
(Fish 139)

Until floppy disks are replaced with a more advanced storage device (or until everyone has a modem), copying floppy disks is a fact of computing life. TurboBackup is simply the most efficient program available today—PD or commercial—for copying AmigaDOS disks (and no, it doesn't copy protected disks).

Why is TurboBackup worth it? Well, for one thing TurboBackup forces you to use verify mode when copying disks. After all, why bother to copy a disk when you can't be sure that the copy doesn't have errors on it? TurboBackup is also extremely fast when copying disks. It only takes 103.5 seconds to copy one disk, compared to the commercial disk copy program *ProjectD* which takes 134 seconds.

TurboBackup will even try its best to copy onto a marginal disk, attempting to write a track five times before notifying you that the destination disk is bad (and then you can tell TurboBackup to try again).

The program also multitasks extremely well and signals you via visual screen flashes and audio beeps when the copy is done. All in all, TurboBackup is a user group librarian's best friend.

Bronze: Warp by MADD

The only real change in archiving programs for the Amiga in 1988 was the appearance of Warp. Warp was not the first track archiver to appear (that award goes to Tracker), but unlike Tracker, Warp was the first *safe* track archiver for the Amiga. Warp was safe in that it would not allow you to warp a disk that had a virus contained in the boot blocks.

Needless to say, until Warp (version 1.1Z that is) appeared on the scene, it was possible to transmit boot block viruses via a modem. Thanks to Warp though this is no longer possible. (This does *not* apply to the IRQ virus!)

Honorable Mention: FFSFlop
by Martin Taillefer
(AmigaZone file #14149)

For those who are desperate to increase the file capacity and read/write speed of their floppy drives (and don't want to wait for 1.4), FFSFlop allows you to use FFS on your floppies *now.* Problems can still happen when using FFS on floppies via FFSFlop, but at least now you can use FFS if you really want to.

Honorable Mention: PcPatch
by Werner Gunther
(AmigaZone file #13973)

Speaking of waiting for 1.4, if you would like to be able to transfer files to/from 3.5-inch MS-DOS disks (without having to buy *DOS-to-DOS),* you would expect to have to wait for 1.4. Instead PcPatch makes it possible to read/write/format 3.5-inch disks (although only in 360K format). These are binary patches designed for the Workbench 1.2 version of PCCopy and PCFormat, but since the sizes of these files haven't changed in 1.3, PcPatch should still work.

Honorable Mention: BFormat
by Bob Bush

If you are annoyed with having to throw away floppies that won't format under AmigaDOS's Format command, you now have an alternative. Although a disk formatted with BFormat can never be copied via any type of track copier (including Diskcopy), at least it can be used!

CLI Improvement/Replacement Programs

Gold: ARP
by Charlie Heath (and many others)

AmigaDOS isn't exactly one of the shining features of the Amiga (although the situation is improving), but at least in terms of the commands inside the C directory, you don't have to put up with AmigaDOS anymore. Although I didn't give an award to ARP (AmigaDOS Replacement Project) last year—mainly since it wasn't finished at the time—it was only a matter of time before ARP showed up here.

Not only have the programmers behind ARP done a great deal to eliminate the problems caused by running the AmigaDOS BCPL-written programs, but they have also improved the replacement programs compared to their AmigaDOS counterparts while still maintaining backwards compatibility whenever possible. Unix-style wildcards, multiple operations and easy-to-understand templates are only a few of the major features of the ARP commands.

By the way, as I'm writing this article, version 1.3 of ARP has been released (look for a review of ARP version 1.3 in the October installment of "Amiga Public Domain"). The new version is fully compatible with all the new changes in Workbench 1.3.

Silver: LS by Justin McCormick
(AmigaZone file #15133)

While LS received this very same award last year, there are two good reasons why the program wasn't supplanted by another program this year. First of all, LS has been improved greatly since it was first released. Now you can print out listings created by LS, since its multi-color feature is now shut off when the output is being redirected. LS now supports residency, the new Workbench 1.3 protection bits, international dates and new sorting options.

While I personally use most of the ARP commands, I will never use any version of Dir again. LS now is almost as superior to Dir as DiskSalv is to DiskDoctor.

Bronze: Rez by Jim Goodnow II

Rez was the first truly freely distributable program that added residency to AmigaDOS. (The ancient Resident command from Commodore you might have seen on a few BBS's way back in '86 was not an authorized release.) Although residency is now supported by both ARP (version 1.1 of ARP, which was the update that added residency, just missed beating Rez to the punch) and Workbench 1.3, Jim Goodnow gets the award for doing it first.

Graphics Creation Programs

Gold: BezSurf by Eric Davies
(Fish 170)

If you thought working with Bezier curves (in *Professional Draw*, for example) was nice, wait until you try Bezier surfaces in BezSurf. Not only can you produce wonderful images in gray scale, but in color as well. BezSurf doesn't support HAM graphics directly, however, you can send the output via BezSurf's Mergergb program to the RAY2 program that is used in DBW-Render and QRT to produce HAM images. Perhaps the wildest part of the package is the ability to wrap IFF images around any 3D object created with BezSurf (making it an alternative to *Photon Paint* for this capability). The numerous control functions help to make all of this easy to do and just as easy to alter if you change your mind.

Silver: QRT by Steve Koren
(AmigaZone file #11733)

While DBW-Render came along early in the Amiga's history and produced amazing results, it had one big drawback in that it was very unforgiving of errors in the input file. QRT doesn't make the user pay for his mistakes. QRT will check the input file's parameters instead of just assuming that the user knows what he is doing. The program also emulates the *Sculpt* line of ray-tracers in that it allows you to build any object from one primitive (quadratics in this case). QRT is the perfect choice for those who want to dabble in ray-tracing before they decide whether to commit serious money (in the form of software and accelerator boards) to this method of graphics creation.

Bronze: Scenery by Brett CaseBolt
(Fish 155)

Considering how quickly this program operates, the graphics rendered are very impressive. You cannot alter the various colors used to render the mountains, foliage and water created in each scene, but you do have control over lighting, water depth, viewpoint and mountain height. The foreground of the picture can look blocky at times, but the back is perfect for use as a background for a picture you are working on in *DeluxePaint* or other paint program. You can't modify images once they are saved, but at least the author did include a save to IFF option in the menus.

Honorable Mention: Contoura
by A.G. Kartsatos
(AmigaZone file #12218; Shareware: $15)

For those who don't have the time for Mandelbrot programs, this program can serve as an adequate substitute. Contoura works in 32 colors, and has some interesting (and unconventional) methods to allow you to control the color palette used. Contoura uses formulas of the type Z=F(X,Y), and allows you to input your own formulas. Contoura's best feature may be its Sample gadget, which allows you to easily render a rough view of any function in seconds, so you can decide whether to devote more time to that scene. The program's big drawback is the lack of a save option, so be sure to have ScreenX or another screen-saving utility handy when you run Contoura.

Graphic Utilities

Gold: ScreenX by Steve Tibbett
(AmigaZone file #12151)

Considering how very successful Discovery's *Grabbit* utility was back in the early days of the Amiga, it's only natural to award the top honor in this category to the program which makes *Grabbit* look very crude indeed.

ScreenX adds many useful options related to saving screens. First of all, by listing all open screens and providing many functions that can be performed on each screen, it makes it pathetically easy to grab a screen no matter how tough it is to get to it.

ScreenX also gives you plenty of information on each screen, so those who are low on memory can make sure that they have sufficient memory before they attempt to grab a screen and then send to the RAM: disk. Plus ScreenX's sleep mode makes it easy to load it up during the startup-sequence and start using programs without it getting in the way (while always knowing that ScreenX is ready to be called upon in an instant).

Silver: SetFont by Dave Haynie
(AmigaZone file #10685)

Before SetFont, if you didn't like the Topaz font when using Workbench or CLI, you couldn't do anything about it except complain. Now with the newest version of SetFont (2.5), not only can you change fonts, but you also have the power to decide which portions of the Workbench/CLI display are affected. This is yet another command that Commodore should give serious consideration to adding to Workbench 1.4.

Bronze: MacFont by Rico Mariani

We all know the Macintosh is still the top dog in the desktop publishing arena (unless you want to print in more than two colors!). Since there are tons of fonts for the Macintosh, why not borrow some from that environment and use them in Amiga DTP programs?

If you hate having to duplicate another person's work (not to mention being able to spend more time laying out your pages) when you really shouldn't have to, you should take full advantage of MacFont. Besides, don't you think computer users should be able to help each other out, even if they don't own the same system?

Honorable Mention: ShowFont
by Arthur Johnson, Jr.
(AmigaZone file #16011)

Speaking of desktop publishing, assuming you haven't memorized every font in your Fonts: directory, doesn't it make sense to have a program like ShowFont? Just because you have used a font before doesn't mean you'll always want to use it (especially if you happen to find out that the design of one letter in the font leaves something to be desired). ShowFont is fast, easy to use, scrolls nicely and can even tell you which key(s) you need to press to render a non-ASCII character in a particular font. *Pagesetter* users (who know it's not fun having to load a new font) will really appreciate this program.

Honorable Mention: Peel
by Andy Lochbaum
(AmigaZone file #12079)

Peel is perhaps the best known PD video effect program for the Amiga. Although it works only on lo-res pictures, it is still very useful. Commodore thought enough of it to feature it in their Amiga 500 videotape entitled "Bringing the Power Home," and that's a pretty powerful testimonial as far as I'm concerned.

Picture Display Programs

Gold: SuperView by David Grothe
(AmigaZone file #14510)

I had a tough time deciding between SuperView and Showiz for top honors in this category. I decided to give the gold to

SuperView, since it offers a more versatile display. In addition to supporting all graphics modes with or without overscan, SuperView also supports blanking the mouse pointer as well as color cycling (and will automatically turn any color cycling on unless you tell it not to).

It also supports the new ILBM author chunk, which allows artists to add a short text file to each picture they create (which seems to be more efficient than having the text information in a separate file). You can use the mouse to scroll through a superbitmap display. There are options for using a batch file to create a slideshow, including separate options for each picture as well as a loop option if you would like to run it forever. Or instead SuperView will display any and all pictures in a given directory.

While the other displayers in this category are also quite powerful, SuperView is slightly superior to the rest overall.

Silver: Showiz by J.L. White
(AmigaZone file #12844; Shareware: $10)

While Showiz is quite powerful, it basically has two main features. First of all, it supports an impressive number (23) of different transitional wipes, while only taking up 23K of disk space. Its other main feature is its ability to display text. Not only will it display text in any color, but it also adds a shadow to the rendered text which looks quite nice. These two important features alone make Showiz more than worth the shareware fee.

Bronze: MultiView by Wayne Houge
(AmigaZone file #12346;
Shareware: amount not specified)

While MultiView may not seem very appealing if you only care about IFF ILBM files, the program definitely supports more picture formats. In addition to IFF and ACBM plus two other AmigaBASIC formats, MultiView supports two Atari ST formats (Degas and NEOchrome) and Macintosh formats.

MultiView also has the unique ability to pull out an image from within an executable program. As if this weren't enough, MultiView will also convert pictures from one format to another, which is something you wouldn't expect in a display program. If you have to deal with pictures that aren't in IFF format, MultiView is what you need.

Animation Display Programs/Utilities

Gold: Display by Martin Hash
(AmigaZone file #12785)

If you're still using ShowANIM, you don't know what you're missing. Display's file requestor makes running ANIM format animations very convenient. The program is impressive for checking out the latest ANIMs at home, as well as for showing off the Amiga to those who don't own one.

To run animations from the Workbench screen you just click on Display's icon and type in the name of the animation. (I do wish, however, that Martin hadn't hard coded the device gadgets, so that I didn't have to type in the name of the hard disk partition where all my animations are stored.)

Display's many keyboard and mouse options give you plenty of control over the animation, especially the speed options via the function keys which I couldn't live without. (Please refer to the listing for MarsFlight below.)

Silver: MakeANIM author unknown
(AmigaZone file #11903)

While *DeluxePaint III* has eliminated the need for this program, back when MakeANIM came out there was no simple way to turn a bunch of IFF pictures into an animation (at least not without shelling out some money).

Bradley Schenck might not have been able to even enter, let alone win the BADGE Killer Demo Contest with his Charon animation if not for this program, and we would all be the poorer for it.

Bronze: ShowANIM by Gary Bonham
(AmigaZone file #13661)

This program deserves an award of some type, even if it is no longer the best ANIM displayer available. ShowANIM still has one big advantage over Display, however, in that it supports icons. While you have to create the icon for each animation first (and many people like myself don't have the time or the talent), icons are simpler and friendlier to use than a file requester for non-experts.

Director Animations

Gold: Walker
by Brian Williams and Imaginetics, Inc.

Needless to say Walker was a breakthrough in Amiga animation, and it's perhaps the most famous Amiga demo, following DemoReel1 (1987) and Juggler (1986). Amiga users are a fairly jaded lot, but when I was running this demo at an Amiga show in Boston when it first came out, many Amiga users looked at this demo in sheer disbelief. Although Walker's graphics are very nice indeed, it's the animation of the graphics that make a person's jaw drop. The fact that this is an animation of a familiar object (an AT–AT Walker) helps non-Amiga fans relate to and therefore be impressed with this animation. The multiple scenes, each with a different perspective, keep the viewer on his toes and interested the whole way through. The great sound effects and the introductory animation (which really is impressive in its own right) add to the package as a whole. There's more to say about Walker, but once you've seen it, it speaks for itself.

Silver: Walker II: The Trailer
by Brian Williams and Imaginetics, Inc.

Although this is only a preview for the real Walker II demo that has not been released yet, it still is more than worthy of an award. Walker II: The Trailer's individual animation sequences aren't quite as astounding as Walker's, but the overall effect is very impressive, especially if viewed on a large projection screen.

I can't wait to see the finished version, although I won't be surprised in the least if Walker II takes 2.5 or even three megabytes to run.

Bronze: DrZorb II
by Timothy Hanna
(AmigaZone file #15820–23)

The first two-megabyte animation by someone other than Imaginetics, DrZorb II is also an amazing animation, but for different reasons. This bizarre animation's best quality is its *two-minute* digitized soundtrack, (those who have audio digitizers know how big an accomplishment that really is). And the large-scale (and synchronized) animation sequences are superb in their own right.

As for the combined effect, what can you say about full-model skeletons dancing to Christmas carols? "Incredibly weird" seems to fit the bill nicely! The only thing I have to say about the author (besides his being just a bit insane) is that Timothy is the only programmer who even came close to challenging Imaginetics' total supremacy in this category.

Honorable Mention: Charon
by Brad Schenck

The BADGE Killer Demo Contest grand prize winner for 1988, Charon couldn't overcome any of the two-megabyte giants in this category, but maybe that's expecting too much. Charon is similar to the famous Probe animation in that it is not really eye-candy, but rather a

demo that must be watched patiently in a distraction-free setting in order for it to work its magic on the viewer. There isn't much animation in Charon, but its beautiful music and stunning graphics (which are even more stunning when you find out that none of the graphics were digitized—they were all either hand drawn or generated internally with *The Director*) create a wonderful effect. After seeing Charon, you won't be surprised to find out that Bradley's art has been on the cover of two Amiga publications (*AmigaWorld* and *AmNews*).

ANIM Animations

Gold: Glass by Allen Hastings
(AmigaZone file #11286)

If you had only ten seconds to show someone why the Amiga is so special, what would you show him? This question is important, since some people simply don't have the time or the patience to sit and watch a multi-minute demo like DemoReel1, never mind wait for a large demo like Walker to load. If I had to make this decision, I would load Allen Hastings' Glass animation. Why? Because it shows many of the most important qualities of the Amiga.

In the background you have a beautiful digitized HAM photograph, which not only shows stunning Amiga graphics but also the fact that the Amiga can receive visual input from the colorful world we live in, and then display the image with barely any degradation at all. In the front you have a three-dimensional multi-shaded goblet (which helps to emphasize that the Amiga is great for creating three-dimensional graphics) that is quickly rotated over the background, which shows the power of the graphics coprocessor chips inside the Amiga. Not bad for an animation that can be loaded from a hard drive in under six seconds!

Silver: Marsflight by Jim Robinson

This is the best animation to date by that master of monstrous *VideoScape 3D* animations, James Robinson. MarsFlight lasts for 15 seconds, but that's on a stock 68000-based Amiga. While MarsFlight is a "nice" animation on a 68000-based Amiga, on an Amiga 2500 it is transformed into a totally different beast.

If you have a friend with a Mac II who loves to boast about his computer's incredible (static) graphics capabilities, just show him MarsFlight on an A2500 (using the Display viewer so that you can easily run the animation at maximum speed), and he won't feel so smug anymore! In steps a mere mortal animation, and suddenly MarsFlight turns into "The Mac II Killer"! If every Amiga were equipped with an A2620 card, MarsFlight would easily have won the gold medal.

Bronze: Twilight

Another huge and impressive *VideoScape 3D* animation. While Twilight doesn't benefit from faster processors as much as MarsFlight does, it doesn't need more speed, since it is quite impressive on a stock Amiga. The one truly remarkable thing in Twilight is the simulated light beams from the light poles, but overall Twilight is still very nice, even on an unenhanced Amiga.

Honorable Mention: Globus by Ker Baer
(AmigaZone file #12289)

This *Animator: Apprentice* animation of a rotating, three-dimensional polished piece of granite is most impressive when you consider that it only took 90 minutes to render on a stock Amiga. While the granite's subtle curves might be tough to duplicate with line/point-oriented programs like *VideoScape 3D* and *Sculpt 3D*, the creators of this animation stated that they only needed to draw two silhouettes of the shape in a paint program, and then *Animator: Apprentice* did the rest of the work.

While *VideoScape 3D* and *Sculpt 3D* seemed to always grab most of the attention in the 3D animation realm in 1988, there are a growing number of alternatives in the Amiga market, and Globus helps to prove that *Animator: Apprentice* is worth serious consideration.

Sculpt Animations

Gold: Gymnast by Marvin Landis
(AmigaZone file #14388–9)

Marvin Landis' newest creation is similar to Walker; while its graphics aren't that impressive (compared to most ray-traced animations), the animation portion of Gymnast is *incredible*.

BoingThrows premiered Marvin's famous computer-rendered friend AmiGuy, but in Gymnast AmiGuy really gets to show off some major athletics! It's quite a feat to even create a realistic 3D rendering of a human and then try to make him walk, never mind have him performing daring release moves on a highbar.

Now I wish I could see the original wire-frame version of Gymnast (which made Amiga users left and right drench themselves in pools of their own drool) fully ray-traced. That would really be an amazing sight for any jaded Amiga owner.

Silver: BoingThrows by Marvin Landis
(Fish #134)

This animation doesn't sport the same level of animated movement as Gymnast, but between its fantastic ray-traced graphics, nicely done digitized sounds and smooth animation, BoingThrows turns plenty of heads. Plus every now and then you come across a person who says something like "Wow, this guy's pretty good . . . he never misses!" Of course, Marvin's two animations had to be fairly fantastic considering he was able to deny the legendary Dr. Gandalf the top two awards in this category.

Bronze: GhostPool by Dr. Gandalf

This is the first of many animations that has made the Doctor a household name in the Amiga community, and I still consider it his best effort to date. Not only does GhostPool last for quite a long time compared to most Amiga animations, but it also astounds non-Amiga owners (i.e., those who can't understand how the pool player is turned invisible) by the nature of the animation itself.

Honorable Mention: 4DAnim
author unknown

If this is merely a simple example of the capabilities of *Sculpt–Animate 4D*, I'm impressed. While there isn't much color in this animation, the incredible gray-scale shading of a spaceship orbiting a glass sphere (which contains inside itself another glass sphere) is amazing, not to mention the countless reflections off the two glass spheres. This animation also shows off the power of Syndesis' *InterChange* program, since the spaceship is instantly recognizable as Allen Hastings' *VideoScape 3D* spaceship from the famous Infinite Loop videotape.

Honorable Mention: Walk
by Eric Daniels
(AmigaZone file #12981–2, 13061)

If reflections off chrome surfaces in Amiga graphics fascinate you, Walk has got to be one of your favorite animations. While the accompanying new-wave soundtrack may not suit everyone's taste, the animation itself is admirable.

Emulation Programs

Gold: IBM by David Donley
(AmigaZone file #12686)

Amiga users can't help but take pot shots at MS-DOS machines at times, and this emulator is perfect for when you're in

a joking mood. Not only are there a variety of puns in this program, but the fun starts when the program loads. Upon loading the program nicely simulates a Guru, and then simulates the loading sequence of an MS-DOS machine. Unlike the 64 emulator below, this MS-DOS emulator does allow you to return to the Amiga environment if you type "GO AMIGA".

Silver: C64 by Eddie Carroll
(AmigaZone file #12590)

This emulator doesn't have as many funny remarks as the MS-DOS emulator, but it is still very humorous. In addition to the commands, C64 also emulates the screen cursor keys in order to fool the unsuspecting onlooker.

Miscellaneous Awards

Gold: Pointer Animator by Tim Kemp
(AmigaZone file #13174)

This is one program you'll never find on any other machine besides the Amiga. Where else could you find a program that can turn the boring arrow pointer into an exciting 16-color animated masterpiece of your own creation? While your MS-DOS friends are finding out what a pleasure a bland pointer can be, I suggest you take some time from your usual Amiga activities to show them some animated pointers (and maybe a few other programs mentioned here), as just a small taste of what today's most advanced computer can do.

Gold: AmyToday by John Rydell
(AmigaZone: various file numbers)

A fresh alternative to the flood of print magazines for the Amiga. Not only is AmyToday free, it also comes out twice as often as most magazines. Of course you do need a modem (or a source of PD programs with a really quick turnaround time) to be able to receive AmyToday while it's still fresh off the word processor, but with today's dirt cheap 1200 baud modems, is that so much to ask?

Gold: WBRexx by Willy Langeveld
(AmigaZone file #14642)

The AREXX language has a large number of supporters, and today it's as well known in the Amiga community as any other language. With that in mind, why shouldn't Workbench-only users be able to benefit from the power of AREXX? Hats off to Willy for opening the AREXX environment to all Amiga users.

That's it, ladies and gentlemen—the best Amiga PD programs of 1988. Assuming that I'll be around for another year, I will be picking from among these programs for possible entries into the Amiga PD Hall of Fame next year. If you'd like to have a say in nominating next year's Amiga PD Hall of Famers, please attempt to contact me either via PeopleLink (ID: G KINSEY), or on the IDCMP BBS (617) 769-3172, 24 hours a day, or through *Commodore Magazine.*

Until then, I hope you'll be keeping up with the newest in Amiga PD programs every month in my regular column right here in *Commodore Magazine.*

***Fish disks:** For a catalog, send a SASE and four loose stamps, or $1 to: Fred Fish, 1346 W. 10th Place, Tempe, AZ 85281*

To sign up to PeopleLink and their AmigaZone, call them at: (800) 524-0100 (voice) or (800) 826-8855 (via modem).

For information on obtaining programs not listed on PeopleLink (or for those who don't have a modem), please write asking for a program by name (or send $2 for an Amiga PD catalog disk; no blank disks, please!) to: SMAUG, 1015 S. Quincy Ave., #112, Quincy, MA 02169.

Technology/Changes in U.S. Copyright Law

Continued from page 48

if copies of their works were first publicly distributed simultaneously in the U.S. and in a Berne Convention country, such as Canada. Public distribution in the U.S. alone was not sufficient. Simultaneous publication was variously interpreted to mean first publication in the U.S. and a Berne Convention country on the same day, or first publication in a Berne Convention country within 30 days of the date of first publication in the U.S.

Simultaneous publication is no longer necessary for American copyright owners. As a result of the U.S. signing the Berne Convention, works created by U.S. nationals automatically qualify for national treatment under it. Eligibility is effective immediately on the date a work is created. Nothing more need be done. It is not necessary to place a notice on works, and there is no waiting period. Furthermore, works that have not been publicly distributed (unpublished works) are eligible for national treatment as well as those that are publicly distributed. This was not the case prior to March 1 under the Berne Convention or the UCC.

Amendments to the Act also change the registration requirement, but only as it affects foreign nationals. Now there is a two-tier registration system, one applicable to foreign nationals and one for American copyright owners. Prior to March 1, the registration requirement applied equally to American and foreign copyright owners. Both were obligated to register a copyrighted work to enforce their exclusive rights.

American copyright owners still must register their works in the U.S. Copyright Office if they desire to file a copyright infringement lawsuit. Otherwise, registration is not necessary. This requirement has been eliminated for foreign nationals. They do not have to register their works to enforce their exclusive rights.

To encourage registration by everyone, the statutory damage amounts in the Act have been doubled. After March 1, the minimum award increases from $100 per infringement to $200, and the maximum increases from $50,000 to $100,000.

Another amendment to the Act concerns the recordation of documents evidencing copyright ownership transfers. Prior to March 1 a person who acquired ownership from someone else was required to record the transfer document in the Copyright Office as a prerequisite to filing an infringement lawsuit. This requirement was eliminated as of March 1. However, recordation is still necessary for other purposes. It can safeguard an ownership transferee in the event of a conflicting transfer. If an ownership dispute arises because ownership of the same work has been transferred to different transferees by the same person, the transfer which is recorded first may prevail.

There are other changes in the Act that should be noted. Compulsory licensing for jukeboxes is eliminated. Architectural drawings are now specifically listed as protectible works in the category of pictorial, graphic and sculptural works. And definitions for "Berne Convention works" and "country of origin" have been added. They are used to determine whether a work is eligible for national treatment under the Berne Convention. In most other respects, the Act remains unchanged.

David A. Weinstein is an attorney with twenty years' experience working with creative people in copyright, trademark and related matters. He is the author of How to Protect Your Creative Work: All You Need to Know About Copyright, *published by John Wiley & Sons, 1987.*

HOW TO ENTER PROGRAMS

The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN, RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

SYNTAX ERROR

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270", type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parenthesis. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the "wrong" line to look at. If the line the syntax error refers to has a function call (i.e., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

ILLEGAL QUANTITY ERROR

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

OUT OF DATA ERROR

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

OTHER PROBLEMS

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than 80 (or 88) characters on one line. You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are on pages 133-134 of the VIC 20 user guide and 130-131 of the Commodore 64 user's guide.

If you type a line that is longer than 80 (or 88) characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line of more than 80 (or 88) characters.

"[HOME]" = UNSHIFTED CLR/ HOME	"[PURPLE]" = CONTROL 5	"[F1]" = F1
"[CLEAR]" = SHIFTED CLR/HOME	"[GREEN]" = CONTROL 6	"[F2]" = F2
"[DOWN]" = CURSOR DOWN	"[BLUE]" = CONTROL 7	"[F3]" = F3
"[UP]" = CURSOR UP	"[YELLOW]" = CONTROL 8	"[F4]" = F4
"[RIGHT]" = CURSOR RIGHT	"[ORANGE]" = COMMODORE 1	"[F5]" = F5
"[LEFT]" = CURSOR LEFT	"[BROWN]" = COMMODORE 2	"[F6]" = F6
"[RVS]" = CONTROL 9	"[L. RED]" = COMMODORE 3	"[F7]" = F7
"[RVOFF]" = CONTROL 0	"[GRAY1]" = COMMODORE 4	"[F8]" = F8
"[BLACK]" = CONTROL 1	"[GRAY2]" = COMMODORE 5	"[POUND]" = ENGLISH POUND
"[WHITE]" = CONTROL 2	"[L. GREEN]" = COMMODORE 6	"[SHFT ^]" = PI SYMBOL
"[RED]" = CONTROL 3	"[L. BLUE]" = COMMODORE 7	"[^]" = UP ARROW
"[CYAN]" = CONTROL 4	"[GRAY3]" = COMMODORE 8	

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

THE PROGRAM WON'T RUN!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is "running". Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

IF ALL ELSE FAILS

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase you understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

Commodore Magazine
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

Have fun with the programs!

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL [RETURN] on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT..) incorrectly. Check the line in the magazine again and check your spelling.

OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake.

The Magazine Entry Programs are available on disk, along with other programs in this magazine, for $9.95. To order, contact Loadstar at 1-800-831-2694.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000  (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
   :GOTO 30
110 IF T<>86200 THEN PRINT
   :PRINT"MISTAKE IN DATA --> CHECK
   DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
```

END

```
5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
   :GOTO 30
110 IF T<>59382 THEN PRINT
   :PRINT"MISTAKE IN DATA --> CHECK
   DATA STATEMENTS":END
120 PRINT"DONE":END
200 PRINT:PRINT"DATA ERROR IN LINE";
   1000+INT((P-4864)/8):END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,98,30,04,C9
1041 DATA 06,30,1E,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
```

END

Software Reviews/Galactic Frontier

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tion about the planet has been revealed.

In *Galactic Frontier* you start out on Earth, and you have to take off into outer space before you can jump to galactic sectors. Unfortunately, to get off the planet Earth you have to sit there while the computer increases your ship's altitude for about two or three minutes. This phase should be eliminated. Eventually, you are confronted with the choice to jump to a new sector or quit the game. Jumping between sectors takes place quickly; traveling between stars or planets within a sector takes 20 or 30 seconds at most, but usually less than ten seconds. The target sector that you jump into is chosen randomly, so the chances are slim that you will enter the same sector again. Sector numbers are eight-digit integers. With as many as 99,999,999 different sectors, you will never see them all in your lifetime. If you happen upon sector 11,303,437 (the sector that contains our sun), make sure that you try to explore Earth and to see if the program included life on the planet or killed us off.

Important measurements in *Galactic Frontier* are Astronomical Units (AU's) and light years. The AU is the distance between the sun and Earth—about 93 million miles. A light year is the distance that light travels in a year at the speed of 186,000 miles per second—about six trillion miles. If a star that you encounter is 50% the temperature of our sun, look for a planet about .5 AU away to have a good chance for supporting life forms. This distance is the equivalent distance of Earth to the sun for that star. Remember, the comparisons that you are given in the data about the stars and the planets are very important. Once you get used to it, you'll be able to tell a life-supporting planet from a barren one.

The program's graphics are simple but effective. As you approach a star or planet, a colored circle representing the heavenly body fills the center of the screen. After a "Lowering Filters" message appears, you get to see what the planet really looks like, with any other colored depressions, bodies of liquid or terrain features of the planet shown on its representation. Land masses, lakes, clouds and hills are all shown. I was surprised to see that each planet I explored had a different look. The looks match the planet's description. It must have been a real challenge to program such detail in *Galactic Frontier.*

In addition to finding life forms by choosing planets and stars to explore, there is a chance in every jump to wind up in a sector with your ship in some sort of danger. If this happens, a message appears on the screen indicating the specific problem (meteor storm, black hole, alien ship, etc.), along with a letter or key that is on your keyboard. These keys are randomly chosen, and you have to hit the key to avoid losing your ship. The amount of time that you are given to hit the key varies from situation to situation. You have only three ships to lose before the game ends, so stay alert while you are playing.

There are four types of life forms (human, humanoid, non-humanoid and alien), and you get different points for each type according to how civilized the type is. In my first try at *Galactic Frontier,* I played for 45 minutes before I found something alive. And after all that, it was only some amoeboid creatures.

The only complaint that I have with the game is that you can't exit the exploration phase of a planet a little bit earlier to avoid wasting time reading all its data. Other than that, I found *Galactic Frontier* to be a pleasant surprise in a sometimes stagnant world of software. Now excuse me while I go search for Elvis—maybe he's in one of those sectors!

Tips & Tricks

Continued from page 11

```
     :FOR C=C TO 6:D$(M,E)=D$(M,E)+Z$
     :Z=Z+1
200  Z$=STR$(Z):Z$=RIGHT$(Z$,
     LEN(Z$)-1)+" ":IF LEN(Z$)=2 THEN
     Z$=Z$+" "
210  IF Z>K THEN Z$="[SPACE3]"
220  NEXT:C=Ø:NEXT:NEXT:FOR Q=1 TO 12
     STEP 3:READ M$,N$,O$:PRINT#1
     :PRINT#1
230  PRINT#1,S$M$Y TAB(11)N$Y
     TAB(11)O$Y:PRINT#1:PRINT#1,
     S$L$S$L$S$L$
240  FOR E=1 TO 6:PRINT#1,D$(Q,
     E)D$(Q+1,E)D$(Q+2,E):NEXT:NEXT
     :CLOSE 1
250  DATA 31,28,31,30,31,30,31,31,30,
     31,30,31,"JANUARY[SPACE2]",
     "FEBUARY[SPACE2]","MARCH
260  DATA "APRIL[SPACE4]","MAY[SPACE6]
     ","JUNE","JULY[SPACE5]","AUGUST
     [SPACE3]","SEPTEMBER
270  DATA "OCTOBER[SPACE2]",
     "NOVEMBER ","DECEMBER
```

64 Sign Printer: Here's one of the most powerful short programs you'll see. It makes it easy to create large, eye-catching banners for events like garage sales, user group meetings or children's parties.

Operation of the program is simple. First you select the width and height for characters, which can range from 1–9. If you press RETURN without entering anything, letters default to a width of three and a height of eight.

You are next prompted to enter the text for your sign. Signs can be printed in uppercase/graphics or uppercase/lowercase. Simultaneously press the SHIFT and COMMODORE keys to switch character sets when entering your message. What you see on the screen is what you will get.

Be sure that your printer is turned on before you press RETURN after entering your sign text.

Your banner will be printed from the last character to the first, with the current character being displayed in the upper right-hand corner of the screen.

Richard Penn
Montreal, Quebec
Canada

```
100  PRINT"[CLEAR,L. GREEN,RVS]
      64 SIGN PRINTER - RICHARD PENN
     [RVOFF]"
110  PRINT"[DOWN2]THIS PRINTS BANNER
     SIGNS."
120  PRINT"[DOWN]PRESSING [RVS]RETURN
     [RVOFF] AT THE PROMPTS DEFAULTS"
130  PRINT"TO WIDTH 3, HEIGHT 8."
140  PRINT"[DOWN]USE SHIFT+COMMODORE
     KEYS TO SWITCH"
150  PRINT"BETWEEN GRAPHICS AND
     UPPER/LOWER CASE."
160  PRINT"[DOWN]WHAT YOU SEE IS WHAT
     YOU GET![DOWN]"
170  CLOSE 1:OPEN 1,4:POKE 53280,Ø
     :POKE 53281,Ø
180  W=3:H=8:X=55296:B$="[SPACE9]"
```

```
    :P$="*********"
190 INPUT"[GRAY3]WIDTH (1-9)";W
    :PRINT"[UP]"TAB(22);
    :INPUT"HEIGHT (1-9)";H
200 PRINT"[DOWN2,WHITE]
    ENTER COPY FOR SIGN...[DOWN]"
    :INPUT M$
210 IF PEEK(53272)=21 THEN X=53248
    :M=H/2
220 FOR T=LEN(M$)TO 1 STEP-1
    :PRINT"[HOME]"TAB(38)MID$(M$,T,1)
    :C=PEEK(1062)
230 FOR Y=0 TO 7:FOR R=0 TO 7
240 POKE 56334,0:POKE 1,51
    :Q=PEEK(X+(C*8)+R)AND 2^Y
    :POKE 1,55:POKE 56334,1
250 IF Q=2^Y THEN A$=A$+LEFT$(P$,H)
    :D=1:GOTO 270
260 A$=A$+LEFT$(B$,H)
270 NEXT:CV=(80-LEN(A$))/2
    :FOR Z=1 TO W:IF D THEN PRINT#1,
    SPC(CV+M)A$;
280 PRINT#1,CHR$(8):PRINT#1,CHR$(15);
    :NEXT:A$="":D=0:NEXT:NEXT:PRINT#1
    :CLOSE 1
290 PRINT"[DOWN19,YELLOW]
    ANOTHER SIGN (Y/N)?":WAIT 198,1
300 GET A$:IF A$="Y" THEN RUN
```

Lotto Ticket Checker: This program is for those of you who buy many lotto tickets at once. It will tell you how many matches you have on each ticket, saving you a lot of manual tomfoolery.

As written, the program is for the popular "six number plus bonus" games such as California Lotto. It can easily be changed to other lotto systems by changing the value of N in line 110. Change it to the number of numbers you pick on the ticket.

If you match all but one number, the program will check the bonus number. If it's a match, a plus sign will appear after the number of matches on the screen. If your lotto doesn't have a bonus number, just enter a non-playable number like 99 to void it.

To use the program, enter the numbers on your lotto tickets into DATA statements at the end of the program. End the last DATA statement with a 99. One sample ticket has already been entered in line 360.

If you buy more than ten tickets, then you'll have to add this line:

115 DIM T(X,Y+1)

where X is the value of N in line 110 and Y is the number of tickets you have bought.

When the winning numbers are drawn, just write them down and run this program. Enter the winning numbers at the prompts. Check them for accuracy, then enter Y at the last prompt. Then sit back and let the computer check the tickets.

John Lauman
Chatsworth, CA

```
100 PRINT"[CLEAR,RVS,SPACE3]
    LOTTO TICKET CHECKER - JOHN
    LAUMAN[SPACE3]"
110 N=6
120 Y=Y+1:X=0
130 READ A:IF A=99 THEN 160
140 X=X+1:T(Y,X)=A:IF X=N THEN 120
150 GOTO 130
160 PRINT TAB(9);"INPUT WINNING
    NUMBERS[DOWN]"
170 FOR Z=1 TO N:INPUT"LOTTO #";W(Z)
    :NEXT Z
180 INPUT"[DOWN]BONUS #";W(Z)
190 INPUT"[DOWN]ARE THEY CORRECT Y/N";
    R$
200 IF LEFT$(R$,1)<>"Y" THEN 160
210 PRINT CHR$(147);TAB(12);
    "WINNING NUMBERS";TAB(33);"BONUS"
220 FOR A=1 TO N:PRINT W(A);"[SPACE2]
    ";:NEXT A
230 PRINT "[RVS]";W(Z);"[LEFT] [DOWN2]
    "
240 PRINT TAB(10)"YOUR NUMBERS";
    TAB(33);"MATCHES"
250 FOR A=1 TO Y-1:FOR B=1 TO N
260 FOR C=1 TO N
270 IF T(A,B)=W(C) THEN PRINT "[RVS]
    "T(A,B)"[LEFT] [RVOFF] ";
    :T(A,0)=T(A,0)+1:NEXT B:GOTO 290
280 NEXT C:PRINT T(A,B);" ";:NEXT B
290 IF T(A,0)=N-1 THEN 320
300 PRINT TAB(35);"[RVS]";T(A,0);"
    [LEFT] "
310 NEXT A:END
320 FOR B=1 TO N:IF T(A,
    B)<>W(Z) THEN NEXT B:GOTO 300
330 PRINT TAB(35);"[RVS]";T(A,0);"
    [LEFT]+":GOTO 310
340 REM
350 REM *** ENTER YOUR TICKETS BELOW
    ***
360 DATA 11,12,13,14,15,16
370 DATA 99
```

Idea Book: The primary use for my computer is printer graphics. Whenever I finish a project, I print out an extra copy and save it in a top-loading vinyl protector sheet in a three-ring notebook.

Now when I start a new project, I can refer back to my old ones for ideas, formats and general inspiration. I've categorized my binder by Business Forms, Greeting Cards, Posters, Flyers and so on.

C. Douglas Wilcox
Martinsville, VA

Larger Labels: Like most computer users, I am aware of the 3 ½″ × $^{15}/_{16}$″ address labels available for pinfeed printers. I often use them for mailing labels.

I recently discovered the 3″ × 4″ pinfeed labels that are commonly used for shipping labels, and I've started to put them to use.

The larger labels are the perfect size for printing short messages which can be affixed to post cards. I've had good results with this by using *geoPaint* and spacing the text and graphics so the labels can be printed three at a time. The labels must be repositioned after each set of three are printed, but the results are worth it.

I've also found that most disk directories print out perfectly on these larger labels, especially when I use the tiny compressed type on my printer. No more gluing or taping for me.

C. Douglas Wilcox
Martinsville, VA

Strings in BASIC 7.0 Filenames: As has been pointed out before, many of the BASIC 7.0 commands don't respond well to string variables used as filenames. For example, BLOAD F$ will return a Syntax Error.

One way around this is to enclose the string variable in parentheses. BLOAD (F$) will BLOAD the file named F$.
Tom Hartley
East Aurora, NY

PaperClip III: This popular word processor has some advanced features such as spell checking and checking spelling as you type. But according to the documentation, you must check your document before loading the dictionary.

After some experimenting, I found that if you load the spell check overlay as soon as you load the program, you can turn on all the spell-checking features. You load the overlay with four presses on F1.

When you press the RETURN key with the highlight bar on the overlay on "check spelling," the dictionary will be loaded into RAM even without any text to check. Now you're ready to use the advanced features.
Patrick J. Dashnaw
South Glens Falls, NY

Star NX-1000C Tips: The manual for this popular and powerful printer states that while the NX-1000C is Commodore compatible, not all its features are available in Commodore mode. The most notably absent feature is high-density graphics.

On many commercial programs, however, it's possible to access some of these features. Here are some of the secrets.

- GEOS: I use GEOS 128 on a regular basis and was disappointed by the printed results at 60 dpi. I got better results by following this procedure:

1. Before booting, turn off the printer and set DIP switches 1 and 5 to the down (OFF) position. The remaining switches should be up (ON).
2. Turn on the printer and boot GEOS. Go to the SELECT PRINTER menu and select the STAR NX-10 driver (*not* the NX-10C). Your documents should print at 80 dpi.

- *PrintMaster:* You can also get 80 dpi printing with this program. The improvement is especially noticeable when printing greeting cards. Also, for some strange reason vertical lines printed with a Commodore driver are jagged. This problem is corrected with the Epson driver. Here's the complete procedure:

1. Before booting, turn off the printer and set DIP switches 1 and 5 to the down (OFF) position. The remaining switches should be up (ON).
2. Go to the SETUP menu and select the EPSON FX driver.
3. Set the EOL (End Of Line) character to carriage return with line feed.

- *CADPAK-128:* This will give you terrific printouts with all proportions correct:

1. Before booting, turn off the printer and set DIP switches 1 and 5 to the down (OFF) position. The remaining switches should be up (ON).
2. Load the CONFIGER program (nice spelling, eh?) and select the EPSON FX driver.

- Other programs: Try similar set-ups with any and all software you use. You'll start turning out better output in no time!

John M. Proctor
Madison Heights, MI

Continued from page 13

he rounds first base, pick up the ball and throw it to second. You'll nail him every time.
Mike McDermott
Tucson, AZ

F-19 Stealth Fighter: If only a few pixels appear on the fuel gauge, don't panic. Empty your weapon bays of all missiles and bombs. When the fuel (including any in reserve) runs out, adjust the F-19 to a pitch of seven and roll of zero. This will give you level flight.

You may ascend slightly with a higher pitch, but watch for the stall speed. If you want to adjust your heading, I suggest a level flight at pitch and roll of eleven.

If you can't achieve level flight as described above, check that your flaps are retracted, that your bay doors are closed, and that your speed brakes are off.

Try to line up with your designated airfield as soon as possible. When you've done so, extend the flaps and adjust the plane to a pitch of nine. Roll to zero for level flight. Note that this slows the F-19 to under 200 knots, which is a useful speed for landing.

Descend steadily as you get closer to the airfield. When you're over the airstrip, your altitude should be under 100 feet.

You'll never have to worry about getting back to base with enough fuel, since you can just glide back without it. With this landing procedure, you can rearrange your flight plan to go over 4000 points on your mission. Just bomb that extra depot or strafe that SAM radar bunker!
Lt. Col. Richard Bersalona
Philadelphia, PA

Falcon: Always be aggressive, never showing fear to your enemy. Attack first. Never disengage unless you're out of weapons. If the enemy is in front of you, don't try a guns or missile kill. Always attack from behind. You can't collide with the enemy, and he can't shoot back.
Dion Slaga
Marinette, WI

Ghostbusters: The PKE meter tells you how much energy there is in the city. When the reading is around 5000, it is a warning of an attack by the vicious Marshmallow Man.

When you're at a job busting a ghost and the meter shows anything above 6000, have your finger ready on the B (for Bait) key when you finish the job. Most of the time he will come right after the job.
Howard Weisbaum
Address Unknown

Ghostbusters: When trying to catch a ghost, superimpose your men so they look like only one. When the ghost is overhead, fire your beam and you've got him!

Be sure to buy these items: PK Detector, for determining the city's PK; Marshmallow Sensor, for turning the building white when the Marshmallow Man is near; Ghost Bait, for use with the Marshmallow Man; Ghost Vacuum, for sucking up yellow ghosts before they reach Zuul.
Contributor Unknown

Gunship: The weapons you choose to carry can make a big difference in determining your success or failure, and the standard armament isn't always best. In Southeast Asia, it's sometimes a

good idea to carry Hellfires, but don't carry any Sidewinders. In Central America, always carry Hellfires, FFAR rockets and Sidewinders.

In the Middle East, all the weapons are usually necessary. But if it's really hot, leave the Sidewinders at home and use the 30mm cannon instead. In Western Europe, carry two sets of hellfires, because the lack of soft targets makes the FFAR rockets unnecessary.
Charlie Sammons
Hew Haven, CT

High Rollers: If you're playing a game against the computer and you don't know the answer to a question, press the left arrow key at the top left of your keyboard. This will return you to the Menu. When you return to the game, a new, hopefully easier, question will show up.
Ricky Wotkiewicz
Virginia Beach, VA

Hardball!: If you swing low, your hit will be a fast grounder. If you swing high, you'll hit a slow bouncer to second.

If the ball goes near either foul line, the infielder won't catch the ball and you can get at least a double.
Ben Ford
West Boylston, MA

Hunter Patrol: Go to the very bottom of the screen and keep yourself tilted to the extreme left or right. You cannot get hit or run into anything.
Eric Snay
Montpelier, VT

Indiana Jones and the Temple of Doom: When you're in the mine tunnels, keep turning the mine car to the left. It's much easier this way, and there's a lot less traffic.
Cory Moore
Westlock, Alberta
Canada

Infiltrator III: Always show guards your papers. Even if they are in order, the guards will call an alert if you don't show them.

If you want to search for something in a guarded room, use a gas grenade when the guards ask you to show your papers. Search quickly, though, because the guard will wake up in a few seconds.
Sam Sundquist
Edmonds, WA

International Basketball: The fastest way to the hoop is by passing. Always pass to the open man, letting him take the ball down the court.

I don't think much of three-pointers, since you only make them about ten percent of the time. Also, only two three-pointers can be made by each team per game. Always work for the inside shot.
Wes Miner
Merrimack, NH

The Last Ninja: On the first level, you'll find a river and a marsh. Don't cross the river, because you'll end up going in a circle and meeting the other side anyway. When you get to the marsh, it's easy to jump it. Just walk onto the timber that touches the path, then push your joystick forward while pressing the button. Repeat this step until you get to the other side.
Tri-Tech
Richmond, VA

Master of Lamps: If you watch the place where the gates appear and keep it in front of your man, you should make it through all the gates.
Jamie Talton
Wetumpka, AL

Master of Magic: To kill the Vampire, you need the Wooden Dagger which you'll find on a defeated enemy's body. He'll be on the large open level. Just move around and kill creatures until you find him.
Michael Denman
Katy, TX

Mercenary II: If you go to location 08,01 and don't know how to get in, just press E. To get out of your jet, press L. To take your medical supplies or a key, press T. To get back into a jet, press B.
Alex Bartonek
Floresville, TX

Micro League Baseball: When the computer pitches out, you should steal or hit and run on the next pitch—the computer never pitches out twice in a row. Also, when there's a man on first or second with 12 or fewer stolen bases, always press 2. Pressing 1 will almost always get him thrown out.
Joe Doktorczyk
San Pedro, CA

Micro League Wrestling: To get your move off, wait for someone else to do his, then press the button as fast as you can.
Ernie Deahyne
Upper Montclair, NJ

Mission Elevator: After getting the first key from the reception, examine doors until you find the Porter. He'll give you a second key. Go to the white emergency doors and you will be able to open them. This procedure repeats with every level.

For more points, look behind paintings to find money. If you like betting, find the table, bet $500, pick the number four, wait five seconds and press the fire button. You will win every time!
Eric Egenhoefer
New Berlin, WI

Superstar Ice Hockey: When someone is trying to steal the puck from you, shoot it over the boards. You will go back to the coaching screen and start with a face-off.
Contributor Unknown

Superstar Ice Hockey: Want to win again and again and again? Learn this shot: Skate right up center ice, and when the goalie moves forward to block you, jerk down quickly and shoot the puck. He has a very hard time jumping down in time to block your shot. Once you get this shot down, you can remain pretty much undefeated.
Michael Denman
Katy, TX

Test Drive: To get the fastest possible speed, shift up on 7000

rpm in the first three gears, and on 6000 rpm on the last two.

Pressing V will give a digital display of your speed and rpm, which helps greatly in making precise shifts.
Matt R. Schaeffer
Fond du Lac, WI

Test Drive: Always pay attention to the road signs. They will tell you if the road is about to turn, and in what direction. The squiggly arrow means that there is a series of turns coming up, one right after the other.
Contributor Unknown

Test Drive: If you're having trouble getting to Level 5, try this: Go as fast as you want on the first two levels, at least if you're any good on these levels. On levels three, four and five, go the speed limit. With practice, you should be able to take every car to the top.
Billy Truitt
Pleasant Plain, OH

Wasteland: If you've found valuable items or weapons in a city and you require more of them, use the Copy option to format a blank disk according to which game disk the item is located on. When prompted, insert the new copy instead of the original.
Jason Spears
Harrison, TN

Wasteland: The Savage Village is one of the easiest places to get automatic weapons. It's located at the lower-left corner of the *Wasteland* map. You'll need some plastic explosives to enter the gate.

When at a store, remember to purchase a Geiger Counter. It will help you avoid stumbling into a Waste Dump.

It's important to raise your IQ, because it lets you learn new skills such as Doctor and Toaster Repair.

When you're in Las Vegas, go to the High Rollers Casino. Kill everybody and search the loot for Antitoxin.

In the Darwin Village bar, you'll find two sick people in a room. Heal and hire one of them.

In the sewers, you can use the rope to cross pits and the sewer rapids.
David Mathias
Address Unknown

Wasteland: Go to the Trading Car in Nomad's Camp. Buy an engine and put it into the water purifier at Camp Highpool. You will be rewarded!
Alex Stoddard
Napa, CA

Zak McKracken: To get the Cashcard under the desk, you must first pull the loose wallpaper and rip it off the wall. Then use the torn wallpaper on the green card. After this, you'll have your Cashcard.
Billy Best
Glendale, NY

Zak McKracken: In London, have Annie give the Whiskey to the Sentry. When he moves, turn off the lever and use the wire cutters on the fence.
Brett Prescher
Gainesville, TX

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